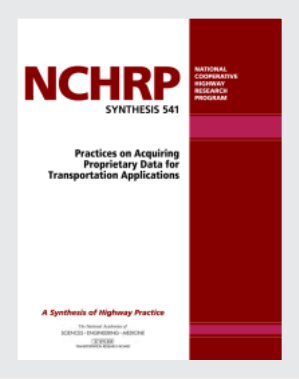

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NATIONAL COOPERATIVE HIGHWAY RESEARCH PROGRAM

NCHRP SYNTHESIS 541

Practices on Acquiring Proprietary Data for Transportation Applications

A Synthesis of Highway Practice

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2019

NATIONAL COOPERATIVE HIGHWAY RESEARCH PROGRAM

Systematic, well-designed, and implementable research is the most effective way to solve many problems facing state departments of transportation (DOTs) administrators and engineers. Often, highway problems are of local or regional interest and can best be studied by state DOTs individually or in cooperation with their state universities and others. However, the accelerating growth of highway transportation results in increasingly complex problems of wide interest to highway authorities. These problems are best studied through a coordinated program of cooperative research.

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The Transportation Research Board (TRB) of the National Academies of Sciences, Engineering, and Medicine was requested by AASHTO to administer the research program because of TRB's recognized objectivity and understanding of modern research practices. TRB is uniquely suited for this purpose for many reasons: TRB maintains an extensive committee structure from which authorities on any highway transportation subject may be drawn; TRB possesses avenues of communications and cooperation with federal, state, and local governmental agencies, universities, and industry; TRB's relationship to the National Academies is an insurance of objectivity; and TRB maintains a full-time staff of specialists in highway transportation matters to bring the findings of research directly to those in a position to use them.

The program is developed on the basis of research needs identified by chief administrators and other staff of the highway and transportation departments, by committees of AASHTO, and by the Federal Highway Administration. Topics of the highest merit are selected by the AASHTO Special Committee on Research and Innovation (R&I), and each year R&I's recommendations are proposed to the AASHTO Board of Directors and the National Academies. Research projects to address these topics are defined by NCHRP, and qualified research agencies are selected from submitted proposals. Administration and surveillance of research contracts are the responsibilities of the National Academies and TRB.

The needs for highway research are many, and NCHRP can make significant contributions to solving highway transportation problems of mutual concern to many responsible groups. The program, however, is intended to complement, rather than to substitute for or duplicate, other highway research programs.

NCHRP SYNTHESIS 541

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ABOUT THE NCHRP SYNTHESIS PROGRAM

Highway administrators, engineers, and researchers often face problems for which information already exists, either in documented form or as undocumented experience and practice. This information may be fragmented, scattered, and unevaluated. As a consequence, full knowledge of what has been learned about a problem may not be brought to bear on its solution. Costly research findings may go unused, valuable experience may be overlooked, and due consideration may not be given to recommended practices for solving or alleviating the problem.

There is information on nearly every subject of concern to highway administrators and engineers. Much of it derives from research or from the work of practitioners faced with problems in their day-to-day work. To provide a systematic means for assembling and evaluating such useful information and to make it available to the entire highway community, the American Association of State Highway and Transportation Officials—through the mechanism of the National Cooperative Highway Research Program—authorized the Transportation Research Board to undertake a continuing study. This study, NCHRP Project 20-05, "Synthesis of Information Related to Highway Problems," searches out and synthesizes useful knowledge from all available sources and prepares concise, documented reports on specific topics. Reports from this endeavor constitute an NCHRP report series, Synthesis of Highway Practice.

This synthesis series reports on current knowledge and practice, in a compact format, without the detailed directions usually found in handbooks or design manuals. Each report in the series provides a compendium of the best knowledge available on those measures found to be the most successful in resolving specific problems.

FOREWORD

By Tanya M. Zwahlen
Staff Officer
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The objective of *NCHRP Synthesis 541* is to gather information about how state departments of transportation (DOTs) and metropolitan planning organizations (MPOs) acquire proprietary data for transportation applications. Recent technological advancements have led to new types of transportation data with characteristics that include improved quality and greater temporal and wider geographical coverage than traditional data sets. State DOTs and MPOs face challenges associated with obtaining new proprietary data. This synthesis may serve as a resource for U.S. transportation agencies seeking better information to make important decisions regarding the acquisition of proprietary data.

The information contained in this synthesis was obtained using three sources. First, a literature review compiled relevant existing research about the topic. Second, the consultant surveyed state DOTs and large MPOs. Finally, the consultant conducted interviews with five agencies that identified how agencies acquire proprietary data, which resulted in case examples and lessons learned that describe how state DOTs and MPOs assess licensing options, caveats and risks, and data negotiations.

Mei Chen of the University of Kentucky collected and synthesized the information and wrote the report. The members of the topic panel are acknowledged on the preceding page. This synthesis is an immediately useful document that records the practices that were acceptable within the limitations of the knowledge available at the time of its preparation.

CONTENTS

Note: Photographs, figures, and tables in this report may have been converted from color to grayscale for printing. The electronic version of the report (posted on the web at www.trb.org) retains the color versions.

SUMMARY

Practices on Acquiring Proprietary Data for Transportation Applications

Data are a critical input into the effective planning, design, operation, and maintenance of transportation infrastructure. Agencies have been collecting various data items to support their planning, design, operation, and maintenance functions. Recent technological advancements have led to new types of transportation data that can provide insights into a wide range of travel characteristics. For example, GPS-based vehicular location data generated by commercial fleets and passenger automobiles with in-vehicle navigation systems have been obtained and processed by third-party data providers into various products such as speed, origin–destination (O-D), and volume. These data items contain rich information on uses and conditions of the transportation system for both motorized and non-motorized modes. They often provide greater temporal and wider geographical coverage than the traditional data sets. State departments of transportation (DOTs) and metropolitan planning organizations (MPOs) have recognized the potential of these data. Many have begun using these data sets for their transportation applications.

The primary objective of this study is to compile and review practices that state DOTs and MPOs have leveraged to acquire and use proprietary data. The focus is on those data generated by technologies such as GPS, mobile phones, or crowdsource travel alerts.

Several approaches were used to gather information for the study. A comprehensive literature review was performed to look at past studies involving data procurement and to establish what types of data agencies have obtained and determine their uses.

An online survey was designed to seek information on three major aspects of proprietary data: (1) data items acquired and applications, (2) procurement method, and (3) use experience. The survey was distributed to state DOTs via an email distribution list with the assistance of the AASHTO Data Management and Analytics Committee. For states that are not on the distribution list, the study team identified DOT personnel in the area of data management, planning, or operations through an online directory search. All 50 state DOTs were invited to participate in the survey. The survey was also distributed to 22 large MPOs with populations of more than 2.5 million. Forty-two state DOTs and three MPOs responded to the survey or participated in phone interviews. Of those states that responded, 79% indicated that they have acquired at least one proprietary data set.

The research team also interviewed state DOT staff from Ohio, Wisconsin, Arizona, and Kentucky—as well as staff from the Atlanta Regional Commission in Georgia—to gain detailed knowledge on agency practices and perspectives on procuring and using these data.

The study found that unmet needs for data and new insights offered by proprietary data are the main driving factors that prompt transportation agencies to acquire proprietary

data. Among the data that have been acquired, speed data are being used widely by transportation agencies around the United States for a variety of applications and have been integrated into mainstream agency business areas by some agencies. Numerous uses have also been found for O-D data enabled by highly precise GPS data from in-vehicle systems and mobile phones. A growing number of agencies are partnering with Waze under its Connected Citizens Program and incorporating Waze incident and jam alerts into their traffic monitoring and reporting services. Crowdsourced smartphone applications also benefit from data collection for bicycle and pedestrian trips. Several agencies have begun to leverage this emerging data source to better understand cyclist and pedestrian patterns and to make informed decisions about infrastructure investment. Many agencies have also procured socioeconomic, employment, and freight movement data—as well as digital maps and aerial imagery data—to support transportation applications.

The study also found that most procurements were directly handled by transportation agencies, while some were handled by consultants (including universities). The survey respondents and interviewees identified several barriers and concerns associated with these proprietary data and shared their perspectives and practices as they relate to these concerns.

Data and service quality: Because the data are passively collected from GPS-enabled devices and processed using the vendor's proprietary method, there is a wide range of concerns over sample size, demographic and geographic biases, accuracy, and data latency for time-sensitive applications. The identified practices to address issues of data and service quality include the following:

- Include clear data specification in the request for proposal (RFP), including temporal and spatial coverage and sample size requirement;
- Request sample data from vendors for evaluation;
- Consider customer service during vendor selection;
- Include a service-level agreement in the RFP and the contract; and
- Specify the exit strategy in the contract.

Cost: Agencies indicated that acquiring proprietary data can be expensive and reported the following practices and perspectives:

- Request detailed cost structure from vendors, including future renewal pricing options;
- Use the standard cost sheet to facilitate comparison among vendors and products; and
- Coordinate with internal units, and collaborate with partnering agencies on data licenses to achieve economies of scale.

Staff expertise and IT resources: These proprietary data are often in large quantity and in a different format, resolution, and referencing system from the agency's existing data system. Data storage, processing, and management needs—as well as integration effort requirements—often strain the agency's information technology (IT) infrastructure and staff resources. Reported agency practices related to this issue include the following:

- Involve agency IT and data analysts in the procurement process; and
- Consider open source, off-the-shelf tools for data processing needs.

Finding the right product: This effort is a challenge as new data and services continue to emerge with advancements in technology. Experience gained by survey respondents and interviewees that may be useful includes the following:

- Use request for information (RFI) to gather data on current market;
- Promote intra- and interagency collaboration to coordinate the data need;

- Develop a clear vision on data uses;
- Consider analytical tools in addition to data; and
- Specify broad agency data needs, and ask vendors to propose services to meet those needs.

Legal issues: Agencies may face use and sharing restrictions under the data licensing agreement. There are also privacy concerns, as well as concerns over potential conflict between the non-disclosure agreement and open records laws. Current practices identified by respondents and interviewees include the following:

- Involve agency legal counsel in contract negotiation;
- Specify terms of use in the contract, and try to include all agency internal business areas while balancing the cost;
- Specify the data-sharing plan in the contract; and
- Specify how to handle open records requests in the contract.

Additional findings related to procurement practices reported by state DOTs and MPOs are as follows:

- Agencies can take better advantage of emerging data sources and more easily navigate intellectual property rights if legislatures revisit and amend existing laws that may restrict or prohibit acquiring or using crowdsourced data collected on the basis of personally identifiable information.
- Establish procedures explicitly for proprietary data acquisitions and applications, which should cover data contracting, sharing agreement, and quality-assessment strategies, as well as market evaluation.
- Incorporate proprietary data into data business plans (DBPs) as an integral component to fulfill departmental business needs and to fill data gaps. Promote coordination and collaboration among different departments within agencies and other state DOTs to make the best use of agency resources and to reduce the cost of proprietary data acquisition, storage, and sharing.
- Identify funding sources for data acquisition. If possible, establish a regular budget to maintain data purchases or subscriptions, given that the data meet the agency's business needs.
- Follow agency guidelines or state regulations, if any, with regard to proposal evaluations. More than two-thirds of the responding states have formal guidelines for evaluating vendors and their products.
- Develop a list of follow-up questions for vendors with regard to their original data sources and the methodologies used for processing data. These questions foster transparency and help the agency better understand the strengths and weaknesses of a vendor's data and approach.
- Ask vendors to discuss the integration efforts based on the agency's need. Request information on vendors' past work on integration with other public entities.

Finally, the study identified the following areas of future research based on current gaps in the practice:

- Develop standard proprietary data license models and application guidelines for those commonly used data types.
- Investigate unit costs of proprietary data.
- Develop guidelines and methodologies to help state DOTs and MPOs: (1) validate proprietary data; and (2) integrate the proprietary data with their own network, such as state DOTs' linear referencing network and MPOs' travel-demand model network.

- Conduct case studies or peer exchange to identify successful practices on proprietary data uses, management, and governance.
- Conduct case studies or peer exchange to evaluate the benefits, challenges, and best practices of forming partnerships among agencies—including state DOTs, MPOs, transit agencies, and local governments—to pool resources and share data.

CHAPTER 1

Introduction

This chapter provides background information, specifies the scope of the study, outlines the research approach, details the survey and interview processes, and describes the organization of the report.

Background

Data are a critical input into the effective planning, design, operation, and maintenance of transportation infrastructure. Agencies routinely collect various data items to support their planning, design, operation, and maintenance functions.

The 2005 Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users mandated the establishment of a real-time system management information program to monitor travel conditions on major highways throughout the United States. The goal was to improve transportation system security, address congestion problems, improve incident management, and facilitate the distribution of highway travel information at the national and regional levels. The mandate was established to set up in all states a system of basic real-time information to manage and operate highways; identify longer-range real-time highway and transit monitoring needs and prepare plans to address those needs; and establish the capability and means to share data with state and local governments, as well as the public. As part of this requirement, state and local governments were asked to develop or update regional intelligent transportation system (ITS) architectures.

At the same time, technological advancements have led to new types of transportation data that can provide insights into a wide range of travel characteristics. For example, GPS-based vehicular location data generated by commercial fleets and passenger automobiles with in-vehicle navigation systems have been aggregated by third-party data providers into various products, such as speed and O-D.

The rapid growth of smartphone use has enabled a number of crowdsourced applications. All major online maps now offer real-time information on roadway traffic conditions, color-coded according to level of congestion. For example, Google Traffic uses a large number of GPS-enabled mobile phones to generate and display speed estimates on a relative scale from slow to fast. Waze developed a smartphone app that allows users to report crashes, hazards, congestion, and other incidents as they travel along the highway.

These data items contain rich information on uses and conditions of the transportation system for motorized as well as non-motorized modes. They often provide greater temporal and wider geographical coverage than traditional data sets. State DOTs and MPOs have recognized the potential of these data. Many have begun exploring the use of these data sets for their transportation applications. Real-time travel-time and incident information have

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been integrated into the advanced traveler information system (ATIS), a component in the ITS architecture. Archived vehicular and non-motorized trip data have been used by agencies to produce performance measures, support model enhancement, and aid with other transportation planning and programming applications. However, agencies face a number of challenges associated with obtaining and using such data.

First, data providers often consider their original sources and their methodologies to clean, process, and aggregate the data as proprietary. As a result, it is difficult for transportation agencies to directly evaluate data sources and determine if the samples are reasonably representative of the traveling public or freight carriers. The lack of transparency is often cited as the main reason agencies are hesitant to acquire the data.

Second, the licensing agreements often place restrictions on what data may be shared. This might create a potential conflict, given that agencies are typically obligated to comply with federal, state, and local open records laws.

Third, these data often come in large quantities, posing challenges to agencies' legacy data-management systems. Additional investment in IT infrastructure to upgrade computing, storage, and management capabilities would be needed. Further, the effort of integrating these data with existing agency data systems is often dependent on staff possessing the requisite skills.

Objectives of the Study

The primary objectives of this study are to compile and review practices that state DOTs and MPOs have leveraged to acquire and use these emerging forms of proprietary transportation data. This study focused on practices pertaining to:

- The types of data that have been acquired and their uses;
- Agency experience on data use, such as integration, evaluation, and caveats;
- The procurement process, including decisions to acquire data, RFP development, product and vendor evaluations, contract negotiations, and use agreements; and
- How agencies handle legal and privacy concerns.

Current procurement practices, as well as advice from responding agencies, are summarized in this report.

Study Approach

The information presented in this synthesis was collected through a review of literature on current practices related to proprietary data, a formal survey of state DOTs and large MPOs, and follow-up interviews with several state DOTs and MPOs—five of which are profiled in depth in Chapter 4.

A comprehensive literature review of current and past efforts at the federal, state, and MPO level to acquire and use proprietary data was conducted to establish what types of data agencies have obtained and their uses. Numerous resources—including the Transportation Research International Database, the University of Kentucky libraries, and web searches—were used to identify literature. Findings of the literature review assisted with the development of survey questions and facilitated discussions through much of the synthesis report.

The study team designed and administered a survey on the state of the practice for proprietary data acquisition. The survey sought information on three major aspects of proprietary data: (1) data items acquired and applications, (2) procurement method, and (3) use experience. The initial survey was reviewed by the panel of this synthesis project and pre-tested at panel

Table 1. Summary of state responses.

Survey Status	Number of States	Percentage of States
Invited	50	100
Responded	42	84
Have acquired proprietary data	33	79 of states that responded
Have not acquired proprietary data	9	21 of states that responded

members' agencies in February 2018. The survey was refined based on the panel's comments and suggestions.

The final survey was distributed to state DOTs via an email distribution list with the assistance of the AASHTO Data Management and Analytics Committee on March 1, 2018. For states that are not on this distribution list, the study team identified DOT personnel in the area of data management, planning, or operations through an online directory search. All 50 state DOTs were invited to participate in the survey. The survey was also distributed to 22 large MPOs with populations of more than 2.5 million with the assistance of the Association of Metropolitan Planning Organizations. A response was requested by March 22, 2018. Email reminders were sent to invitees who had not responded to the survey. The deadline was postponed for agencies that were unable to complete the survey on time. During the period, the study team sent follow-up emails and made phone calls to increase the response rate. Appendix A contains a copy of the survey questionnaire.

Forty-two state DOTs and three MPOs responded to the survey or participated in phone interviews between March and June 2018. Responses are summarized in Table 1. The state response rate was 84%, satisfying the minimum threshold requirement set out by NCHRP. Of those states that responded, 79% indicated that they have acquired at least one proprietary data set. Figure 1 shows states that have acquired proprietary data, that have not acquired any proprietary data, and that did not respond to the survey.

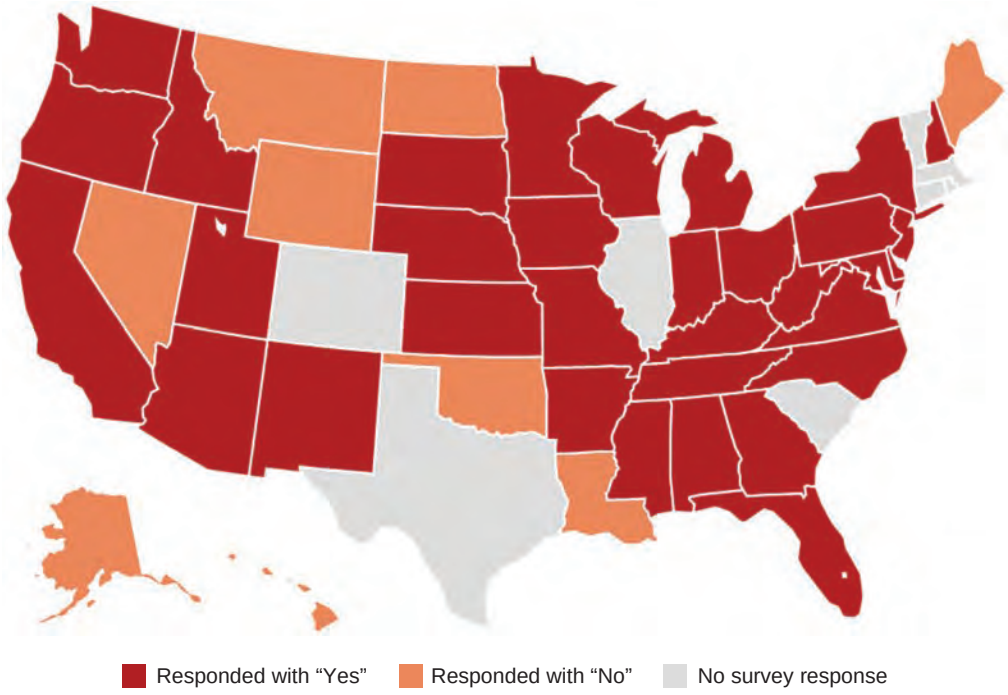

Figure 1. State responses to the question, "Have you acquired proprietary data?"

State DOT staff from Ohio, Wisconsin, Arizona, and Kentucky were interviewed, as were staff from the Atlanta Regional Commission, an MPO responsible for transportation planning in a 10-county area of North-Central Georgia. Their agencies' experiences procuring and using proprietary data are discussed in Chapter 4. The case examples supplement the high-level survey findings reviewed in Chapter 3. Agencies thinking about obtaining proprietary data from third-party vendors can leverage information from the case examples to streamline the data acquisition process.

Report Organization

This synthesis report consists of five chapters:

- Chapter 1: Introduction. This chapter provides background information and summarizes the purpose and study approach of the project.
- Chapter 2: Overview of Proprietary Data. Results of the literature review are summarized in this chapter. An overview of proprietary data types and their sample uses is provided, including speed or travel time, O-D, freight, incident, and non-motorized travel. In addition, current procurement practices and legal issues associated with proprietary data are also discussed.
- Chapter 3: Practices on Proprietary Data Acquisition. This chapter summarizes and discusses the main findings based on the responses received from state DOTs and MPOs.
- Chapter 4: Case Examples. This chapter documents proprietary data acquisition in greater detail by looking at the practices and experience of four state DOTs and one MPO. Reflections by agency staff interviewed about the experience gained in the process are presented in the form of peer advice.
- Chapter 5: Conclusions. This chapter summarizes key observations and findings assembled through the literature reviews, survey, and interviews. It contains a list of successful practices as reported by respondents and interviewees for peer agencies to consider when procuring data.

CHAPTER 2

Overview of Proprietary Data

This chapter briefly reviews proprietary data sources, services, their uses, as well as past procurement experiences. The focus is on emerging proprietary data generated by technology (e.g., GPS and crowdsourcing) in recent years. The content in this chapter is based primarily on the literature review and includes—but is not limited to—the following topics:

- Data sources and their uses,
- Past practices and studies on data procurement, and
- Legal issues relevant to proprietary data procurement.

Data Sources and Their Uses

This section reviews the proprietary data sources that are available for transportation applications. While in the past, agencies have acquired many types of data sets, such as freight commodity flow data, this study focused on data products derived from the passively generated data by ever-prevalent tracking devices. For example, in-vehicle navigation systems generate vehicle location data using GPS technology. Smartphones also generate locational data when they use location-based services (LBS), such as when searching for nearby restaurants. Data vendors acquire raw GPS traces or LBS data and process, integrate, and develop them into products such as travel speeds, routes, O-D, and volume.

The data items reviewed are listed below. The review is based on information provided by survey respondents. As the study primarily focused on travel data enabled by new technologies, items such as the socioeconomic data and digital maps are included but with fewer details compared to the other data types.

- Speed or travel-time data;
- O-D data;
- Freight- and truck-specific data;
- Crowdsourced incident data;
- Crowdsourced non-motorized travel data; and
- Other data, such as socioeconomic and street network map.

Speed or Travel-Time Data

Speed or travel-time data are the central and most common pieces of information required for operational and planning applications. Traditional methods of collecting these data include the installation of instruments such as loops, radar detectors, Bluetooth readers, and license plate readers. On corridors with electronic toll collection systems, travel time can be estimated using toll tag readings as vehicles travel through the corridor. However, these methods require

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agencies to direct significant resources toward the deployment, operation, and maintenance of these sensors. Because of limited funding and federal requirements pertaining to the distribution of travel information, major highways such as freeways in urban areas are often well instrumented, while urban arterials and rural roads are less likely to have enough coverage (Crowson and Deeter 2012).

The ubiquity of GPS tracking technologies in commercial fleets, passenger automobiles, and smartphones has carved out new opportunities for businesses to leverage the data generated by these devices. Companies such as INRIX, HERE (previously NAVTEQ), and TomTom have contracted with fleets and consumer automakers to access the GPS location data generated by these vehicles.

With the increasing market penetration of GPS-enabled devices, the availability and quantity of speed or travel-time data have rapidly increased. Technological advances have resulted in the continuous improvement of data quality, as well. The greatest coverage of GPS data was found initially on heavily traveled urban arterials; however, as the market penetration of GPS devices has expanded, data are becoming widely available for collectors, local roads, and even in rural areas.

In this study, the vehicles with GPS-enabled devices that contributed to real-time collection of speed or travel-time data are referred to as probe vehicles. The data collected from probe vehicles are referred to as probe-vehicle data or probe data. Other terms, such as third-party data or private-sector data that essentially have the same meaning and are used by agencies, will be used interchangeably with probe-vehicle data in this report. Agencies use probe-vehicle data in a variety of ways, which were summarized in a recent study (Athey Creek Consultants 2017). Data are commonly used to inform the public of travel times and traffic incidents on dynamic message signs (DMSs), to display traffic condition information on traveler information websites, to populate highway operating conditions displays at traffic management centers, and to confirm whether an incident has occurred. As such, they can be valuable for traffic and incident monitoring. The study also discussed additional uses in which speed data can be analyzed using special tools, such as probe data analytics suites for applications like dashboards for congestion identification, work zone queue warning systems, and slowdown and delay warnings (Athey Creek Consultants 2017). Archived historical speed or travel-time data are often used for corridor studies, system performance measurements, and travel-model validation.

Several examples illustrate the uses that state DOTs have found for probe-speed data. A typical use of real-time speed data is the display of traffic conditions as a color-coded layer on a 511 traveler information web page. Figure 2 shows a screenshot of the live traffic map hosted by the I-95 Corridor Coalition, a consortium of "transportation agencies, toll authorities, and related organizations, including public safety, from the State of Maine to the State of Florida, with affiliate members in Canada" (I-95 Corridor Coalition 2018). The measured speeds are shown on the map, from the lowest speed range (less than 15 mph) to the highest speed range (greater than 50 mph). Users can also choose to display other measures, such as the level of congestion, defined as the ratio between the measured speed and unrestricted speed.

Another use case of real-time data is the detection of non-recurring congestion. Indiana DOT cooperated with Purdue University to develop a real-time queue monitoring system using INRIX 1-minute interval speed data at the Traffic Message Channel (TMC) level (Li et al. 2015). The system continuously records the speeds on all links along a route and then computes the speed difference (i.e., delta speed) between any two adjacent links. If any delta speed falls below a predefined threshold, the system triggers an alarm notifying the traffic control manager. This information is disseminated to travelers to warn them of slowdowns, as well as to patrol officers, so that they can respond to non-recurring congestion more quickly. Figure 3 illustrates

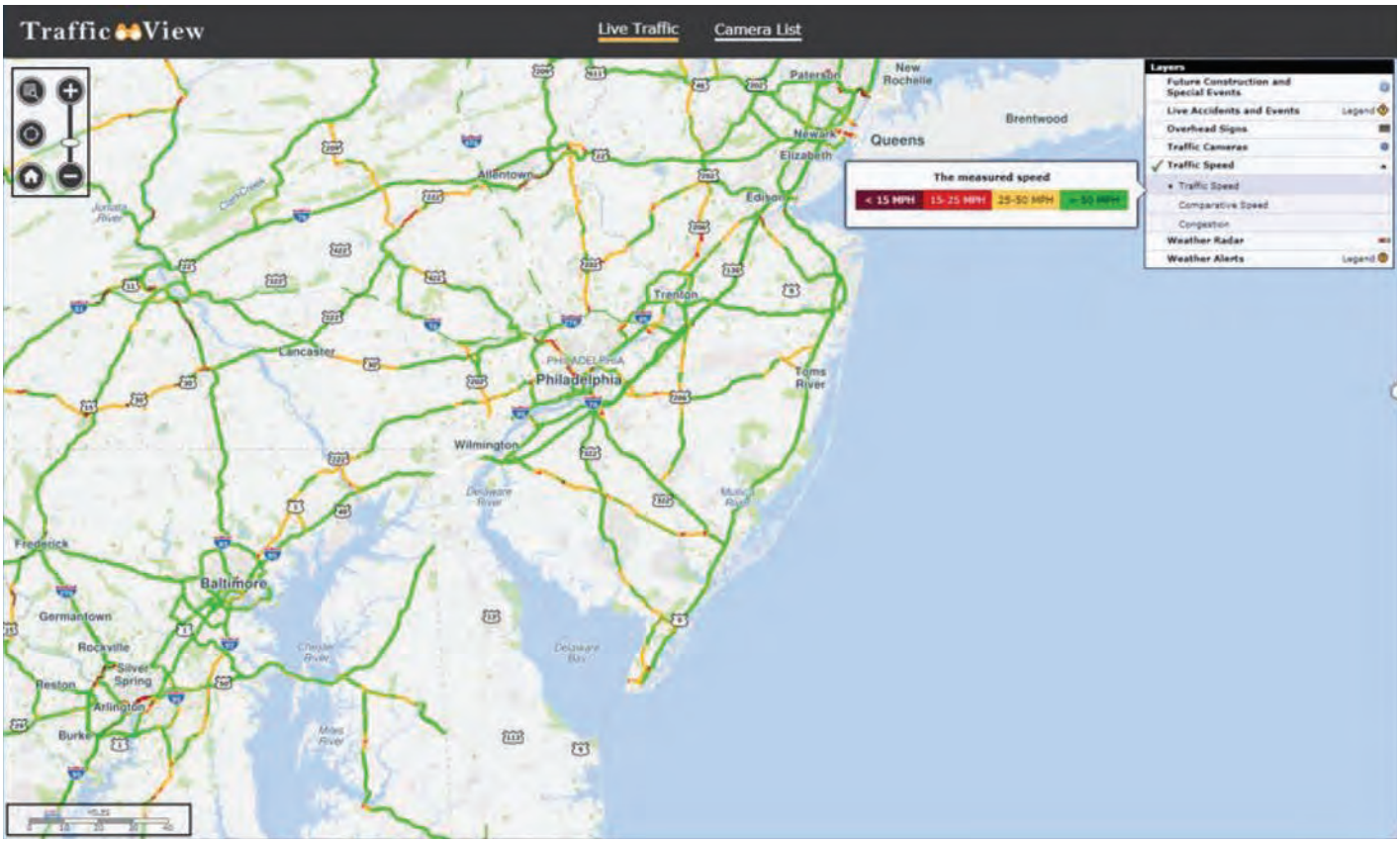

Figure 2. A screenshot of I-95 Corridor Coalition live traffic map (I-95 Corridor Coalition 2018).

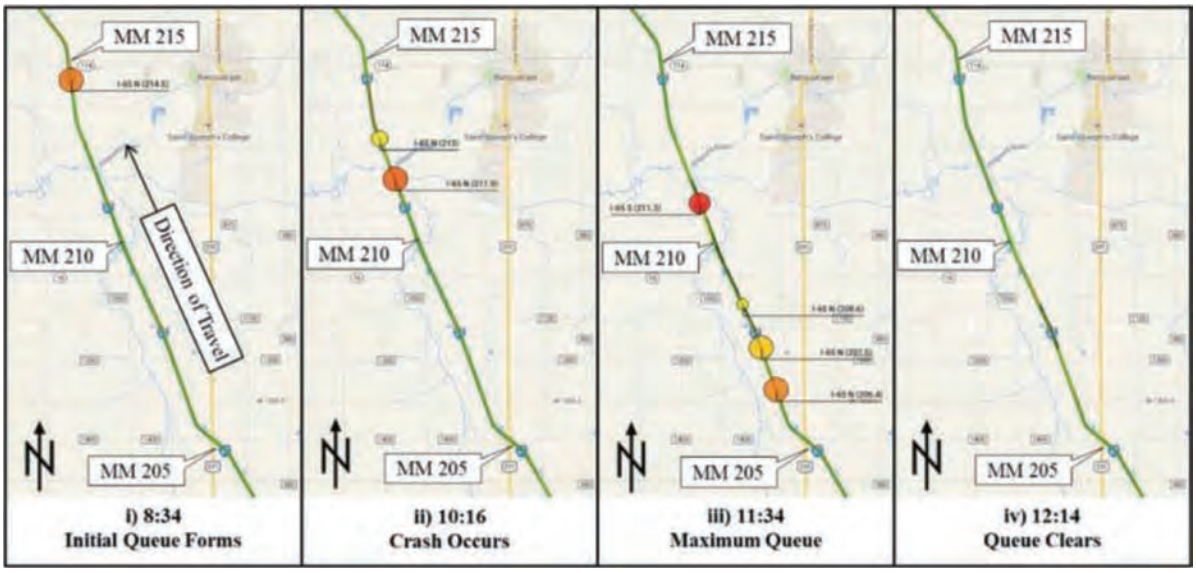

Figure 3. Queue development over time (Mekker et al. 2016).

12 Practices on Acquiring Proprietary Data for Transportation Applications

queue development over time caused by two crashes on a section of I-65 northbound in Indiana. The initial crash occurred at around 8:30 a.m. near Mile Point 215, with the southernmost large circles indicating the back end of the queue. Another crash occurred at 10:16 a.m. at the back end of the queue just as the queue from the first crash was about to clear. As a result, a longer queue formed and lasted for about 2 hours and extended nearly 10 miles upstream.

Historical or archived speed data, on the other hand, are frequently used for performance measurements. Because of the large amount of data collected, it is possible to compute numerous performance measures, including travel-time reliability metrics, which normally require at least 1 year of data. When multiple years of data are available, agencies can derive performance measures annually and track performance over time. Figure 4 illustrates levels of travel-time reliability based on data from 2016 on Maryland's state freeway–expressway system (Mahapatra et al. 2017). Travel-time reliability is a measure of consistency in day-to-day travel time for the same trip (e.g., daily commute). Planning-time index (PTI) is the ratio between the 95th-percentile travel time and the free-flow travel time. A PTI value of 1.5 indicates that a traveler needs to plan 45 minutes for a trip that normally would take 30 minutes under uncongested conditions. The higher the PTI value, the lower the travel-time reliability.

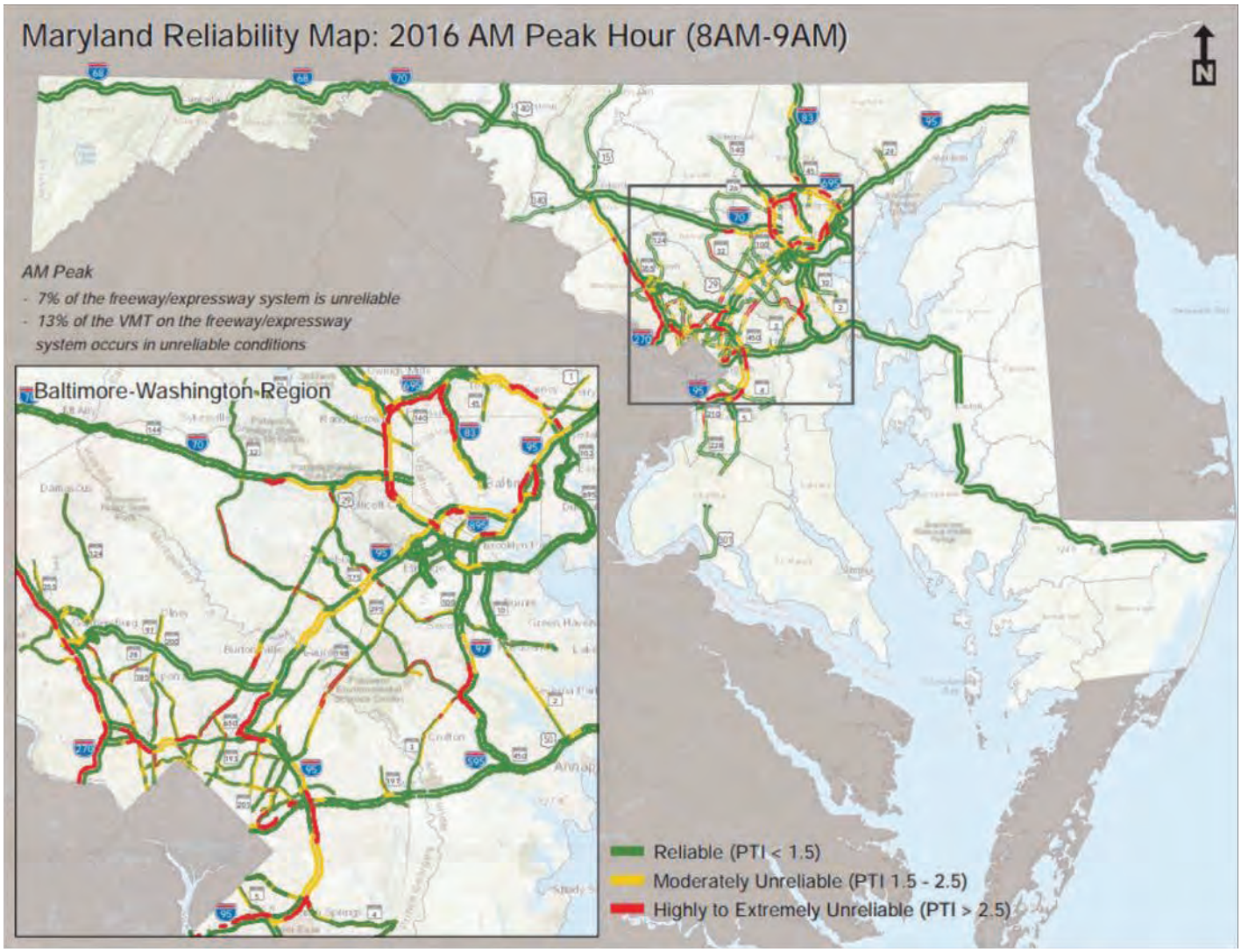

Figure 4. Maryland highway reliability map (Mahapatra et al. 2017).

The Kentucky Transportation Cabinet (KYTC) acquires historical probe-vehicle speed data to support its congestion management program and to evaluate roadway performance (Chen and Zhang 2017). Data have been used to develop travel-time-based performance measures and validate the methodology used for systemwide network screening and project selection. They also supplement the National Performance Management Research Data Set (NPMRDS) through the provision of speeds on many roadways outside the National Highway System (NHS).

Another important application of speed data is validation and calibration of travel-demand models (Cambridge Systematics, Inc. et al. 2012). Travel-demand model validation and calibration is an integral part of the process for developing demand models and ensures the reasonableness of model outcomes. Speed data can have multiple uses. First, free-flow speed is an important input for the model and is traditionally estimated using the *Highway Capacity Manual* and similar methods that rely on geometric attributes. Free-flow speed can be derived from probe-speed data. Volume-delay functions (e.g., Bureau of Public Roads functions and Akçelik functions) are calibrated to achieve a better goodness of fit between speed and congestion level. The Wisconsin DOT has calibrated speed flow curves using INRIX speed data for cost–benefit analysis. As *NCHRP Report 716: Travel Demand Forecasting: Parameters and Techniques* points out, agencies have increasingly looked at link speeds and travel times—in addition to volume- and trip-length-based measures—for travel-demand forecasting validation (Cambridge Systematics, Inc. et al. 2012). Probe-speed data can be used to provide such information directly.

Despite the immense amount of information conveyed by GPS data, they also have limitations. For example, the sample size of vehicles from which probe-vehicle data are collected varies significantly across road types. On less-traveled roads, especially in rural areas, probe-vehicle data can be sparse. Although congestion is less likely to be an issue for these roads, the utility of probe-vehicle data for systemically tracking their performance can be limited. Validation of probe-speed data is often required. More issues and caveats of the speed or travel-time data will be discussed in detail in the Use Experience section of Chapter 3.

Origin–Destination Data

O-D data are critical inputs for many transportation applications, including the calibration and validation of travel-demand models, detour planning, and corridor studies. Traditionally O-D data have been collected via household travel surveys, license plate matching, and roadside surveys. However, using these data collection methods to obtain sufficiently large samples is very costly. This is especially the case in large geographic areas. One downside of these methods of collecting O-D data is that their ability to capture long-distance travel is quite limited. For example, license plate matching only documents trips passing through locations at which license plate readers are stationed.

Cellular and GPS location data offer insights into the origin and destination of probe vehicles, as well as the routes they take to complete their trips. Because of privacy concerns, data providers often need to anonymize data to remove any personally identifiable information.

Consumer smartphones that have location services enabled are another major source of O-D data. For example, as a passenger in a car searches for a restaurant at the next highway exit, the locations of this user would be part of the data generated by the LBS. This type of data have been used in business intelligence applications, such as helping billboard owners determine how much to charge for billboard advertisements based on the number of people passing it each day or to help merchants estimate the exposure of their advertisement better.

LBS data have been integrated with probe-vehicle data for transportation applications. Data providers have established cloud-based platforms that let users query trips between user-specified origins and destinations. These data offer a number of opportunities for agencies to gain insight into travelers' route choices. These O-D data are collected from smartphones and navigation devices continuously, whereas traditional surveys only provide a snapshot of travel behaviors at the time of the survey. In densely populated urban areas, these data tend to be more abundant than in rural areas because of the higher market penetration rate of GPS-enabled devices. These data provide both O-D and travel–time matrices in a way that is more appropriate for validation and integration with travel-demand models (Kressner 2017). Such data can cover large geographical areas and have the flexibility to aggregate trips into various spatial and temporal levels.

The Idaho DOT has developed trip matrices using cell phone–based O-D data for the statewide travel-demand model (Stabler 2014). The agency procured O-D data for the average weekday resident home-based work and home-based other trips, as well as non-home-based trips for both residents and visitors. Data were obtained in super zone matrices to reduce the cost and then disaggregated to smaller model zones based on each model zone's share of population and employment in the super zone. Cell phone O-D data were used to synthesize travel demand and to estimate external travel. Reasonable goodness of fit was found between trip-length distributions for cell phone O-D data and Boise MPO travel survey data. However, significant differences were found for non-home-based trips, especially short-distance trips, possibly because of different definitions used in the MPO survey and vendor data. The data were licensed only for the travel-demand model project, but derivative tables and reports can be used for other applications.

Recently, O-D and probe sample data have been used to estimate average annual daily traffic and average annual hourly volume. A study conducted by the Texas A&M Transportation Institute for the Minnesota DOT evaluated volume estimates from StreetLight and found that the errors of many estimates—especially on lower-volume roads—are too high to be acceptable, demonstrating the need for further research (Turner 2017).

Freight- and Truck-Specific Data

Many state DOTs and MPOs need freight movement data for truck travel models. Traditionally, these data have been gathered through commodity flow surveys. FHWA's Freight Analysis Framework (FAF) commodity flow database includes O-D of freight by commodity type and estimates of flows on major routes and segments. A major issue with this data set is its very limited spatial resolution. For example, even though FAF data are available at the county level for internal use within the U.S. Department of Transportation (U.S. DOT), they are much coarser in the released version (Donnelly and Moeckel 2017). State DOTs and MPOs have acquired the commodity flow database from Transearch. Survey respondents (see Chapter 3) noted that their primary purpose in acquiring freight commodity flow data is to develop or update statewide or regional travel-demand models. Agencies have been purchasing access to these databases for many years.

GPS data generated by commercial fleets are disaggregated, providing much finer-grained information on truck movements. One disadvantage of these data is their lack of particulars on cargo and truck behavior, which are obtainable through commercial travel surveys.

A 2014 Florida DOT study used truck GPS data obtained from the American Transportation Research Institute (ATRI) for a number of applications (Pinjari et al. 2014). Data were collected via a joint effort between ATRI and FHWA to measure freight performance on the nation's major highways. Evaluation of the GPS data indicated that they capture approximately 10% of

heavy truck volume observed on Florida's highways. Using these data, Florida DOT developed truck travel speed by time of day for the state's Strategic Intermodal System highway network. Truck trips and their characteristics—such as trip duration, trip length, and speed—were developed, as well. Truck O-D tables were also developed for a statewide travel model.

Crowdsourced Incident Data

With more consumers than ever owning smartphones, applications that crowdsource traffic incidents and delays are on the rise. One example is Waze, a smartphone app that allows users to post alerts when they observe or encounter incidents such as crashes, hazards, and traffic jams. Through its Connected Citizens Program, Waze partners with state and local transportation agencies to exchange data. Waze gives agencies access to the incident and traffic jam feeds generated by its users, and in return agencies provide Waze information on construction, road closures, special events, evacuation routes, and other alerts they generate.

The most frequently cited use of Waze data among agencies is the provision of incident awareness to traffic operation centers. Some agencies (e.g., KYTC) post Waze-generated incident alerts on their traveler information websites as a separate layer marked as Waze alerts. Others use Waze alerts as a secondary source of information for traffic incident management.

Waze alerts provide a data source for highway traffic monitoring, especially in rural areas where state DOTs are less likely to have good sensor coverage. A study comparing 1 year of Waze incidents in Iowa with those recorded by the state's advanced traffic management system (ATMS) found that Waze offered a 12% increase in coverage over the current ATMS (Amin-Naseri et al. 2018). ATMS relies on sensors or probe-speed data to detect incidents. Usually, an ATMS detects incidents when significant speed reductions are observed. Relying on speed observations alone can produce a lag in incident detection. Additionally, on lightly trafficked roadways and during off-peak time periods, incidents may not always result in speed reductions. In many cases, Waze data provide faster incident detection in areas without cameras.

However, there are additional considerations to examine with regard to Waze data. Because users generate incident reports, the same incident may be reported multiple times by different users. Redundancies, inaccuracies, and mismatches discovered in Waze reports may require an agency to dedicate a significant amount of time to processing and validating the data before using it. Although coverage is typically more extensive on rural roads than is provided by state DOT sensors, it is still likely that traffic incidents are underreported depending on the time of day, traffic levels, and the number of drivers using the Waze app. Freeways and heavily traveled arterials tend to be well represented throughout the day.

Crowdsourced Non-Motorized Travel Data

Evolving technology also benefits data collection targeting non-motorized travel. Crowdsourced smartphone applications let runners and bikers track their activities, which state DOTs and MPOs can potentially use to gather information on where these trips occur.

One study leveraged Strava cycling data to estimate bicycle trip volume for Miami–Dade County (Hochmair et al. 2017). Data on user rides across time periods were aggregated and attached to street network segments. Commuter trips were identified using either a commute status indicator, the duration and distance constraints of cycling trips, or predetermined rules created by Strava. These data were used to derive bicycle ride counts at the segment level, as well as bicycle kilometers traveled at the census block group or higher level, as shown in Figure 5. The study observed that the data have great spatial and temporal resolution and coverage. They

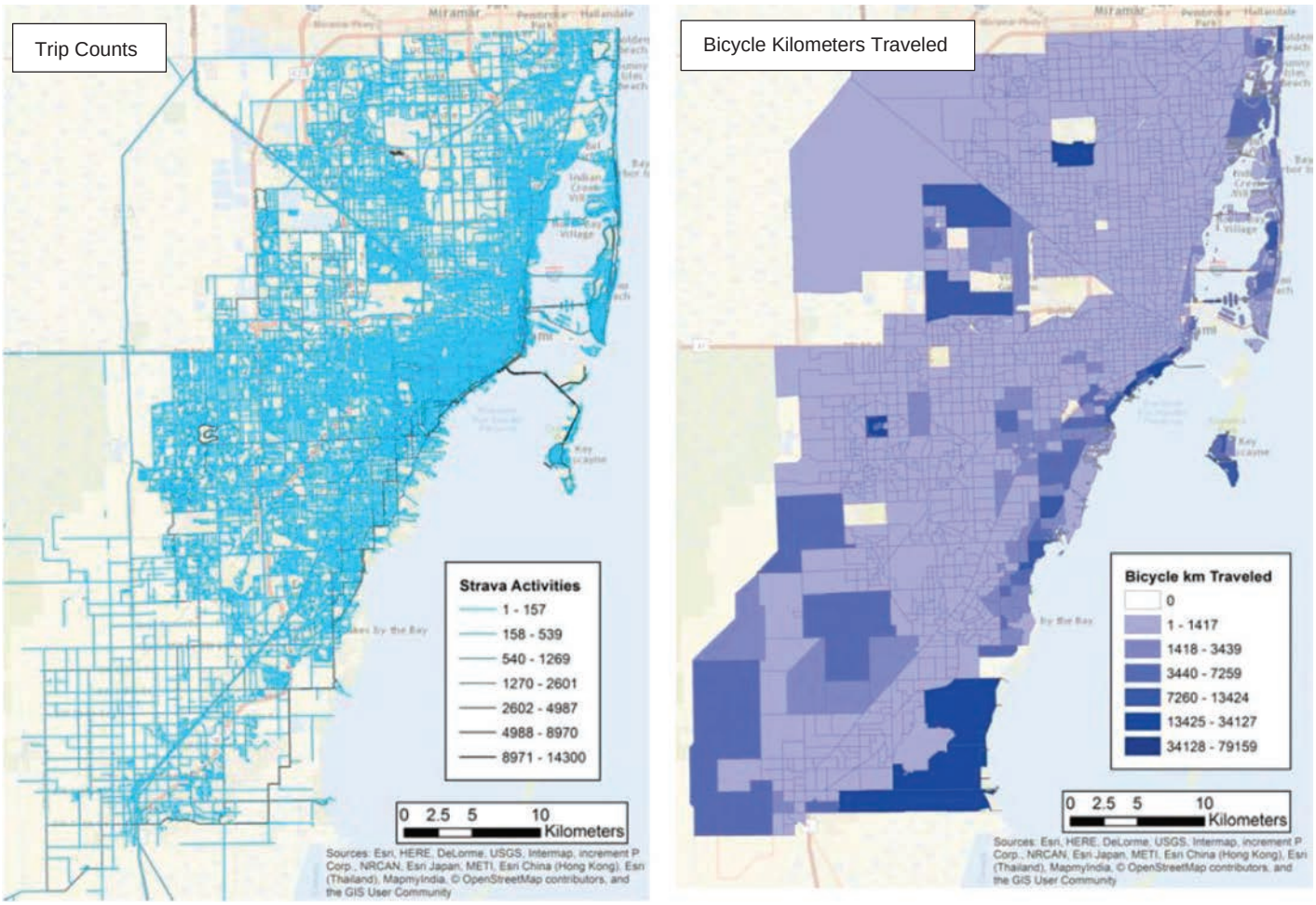

Figure 5. Bicycle trip counts and bicycle kilometers traveled in Miami–Dade County (Hochmair et al. 2017).

were used to develop regression models to evaluate bike ridership for non-commuter and commuter trips during weekdays and weekends, respectively.

Watkins et al. (2016) documented a study that collected cyclists' data from crowdsourced smartphone apps in Atlanta, Georgia; developed an open source procedural standard for data cleaning and map matching; examined how the sociodemographics of cyclists affect their route preferences; and developed a route choice model for planners. They found that the self-reported demographic characteristics of cyclists are useful for classifying them as a particular type of rider. Further, the findings can be used to identify the most impactful routes and links, which, if improved, would drive up the rate of cycling.

Other Data

Socioeconomic data Nine states among this study's survey respondents reported that they have acquired proprietary data on population, employment, household information, economic conditions and forecasts, commodity costs, and revenue forecasts, among others. These data are used in demographic analyses; market studies; identification of employment centers and employment numbers; state highway user revenue forecasts; statewide, regional and MPO travel models; assessments of economic impacts from roadway projects; and evaluation of policies outlined in planning documents.

Digital map and aerial imagery Six states have acquired street maps and imagery from private vendors. Agencies obtained these data because they are more cost-efficient than collecting and maintaining image collections in-house. These data have been mainly used for spatial analysis, routing vehicles during snow and ice removal operations, analyzing highway networks to create more efficient and smarter routes, adding geographic information system (GIS) layers into web and desktop applications, sharing information, and outreach.

Analytic Tools

Large data sets create challenges for state DOTs and MPOs because the data standards of these new data often differ significantly from those of their legacy systems. Real-time and historical speed data and crowdsourced data are often referred to as "big data." Big data require that agencies have immense storage capacity and specialized computing resources and technical expertise. Many agencies, however, lack these assets. When agencies issue RFPs to license these data, they often require analytic tools from the vendor or a third party to leverage computing power so that they can access a user-friendly interface to built-in functionalities that will meet their business needs. Several agencies that responded to the survey (see Chapter 3) indicated that they specified the right to have access to Regional Integrated Transportation Information System (RITIS) and Iteris' Performance Management System (iPeMS) tools in their data acquisition. These tools and their applications are briefly described below.

RITIS The wide range of tools offered in RITIS are used to process, visualize, and share data, with the goal of enabling "a wide range of capabilities and insights, reducing the cost of planning activities and conducting research; and breaking down the barriers within and between agencies for information sharing, collaboration, and coordination" (RITIS 2018).

For example, the Maryland DOT has used RITIS's Massive Data Downloader, Bottleneck Ranking, and Major Corridor Summary Reports to address the need of congestion monitoring for its annual *State Highway Mobility Report*. South Carolina DOT used RITIS tools to conduct the after-action review for the massive congestion associated with the solar eclipse on August 21, 2017 (RITIS 2018).

iPeMS Some agencies have been using this transportation network management tool to ingest and process third-party traffic data and to generate reports and visualizations (iPeMS 2017).

The Oregon DOT recently used iPeMS to study congestion associated with the 2017 solar eclipse. Using the real-time and historic traffic data visualization tool, the agency pinpointed areas where bottlenecks occurred and referenced them to historic travel-time data. The tool gave the Oregon DOT the ability to warn residents in areas where heavy traffic is uncommon of impending events likely to produce significant congestion. These warnings help alleviate the magnitude of traffic jams in real time. After the eclipse, the Oregon DOT studied the effects of traffic during the eclipse. Based on this analysis, the agency will be better prepared for the next solar eclipse in 2024.

Practices on Data Procurement

Federal, regional, and state entities have acquired proprietary data in recent years. This section reviews their procurement practices and documents strategies recommended by several studies. The literature review focuses on the following practice and studies:

- Two editions of the NPMRDS acquisition,
- I-95 Corridor Coalition Vehicle Probe Project,

- FHWA report, *Private Sector Data for Performance Management*,
- *NCHRP Project 70-01: Private-Sector Provision of Congestion Data*,
- California Partners for Advanced Transportation Technology (PATH) pilot procurement of third-party data, and
- FHWA report, *Applying Archived Operations Data in Transportation Planning: A Primer*.

National Performance Management Research Data Set

The Moving Ahead for Progress in the 21st Century (MAP-21) Act set performance management requirements for state DOTs and MPOs. To help them meet this requirement, the FHWA obtained the NPMRDS, which contains probe GPS travel-time data.

The first NPMRDS contract was awarded to HERE. The data were delivered in two parts: a TMC static file, as well as travel times for passenger vehicles, freight trucks, and combined passenger and freight vehicles georeferenced to TMCs. The RFP for this acquisition required that actual data be provided without historical data substitutions. Also, the RFP specified that data should cover the entire NHS, as defined by MAP-21; present travel times in seconds, in 5-minute increments, 24 hours a day, 7 days a week; and that the data sets should be delivered monthly and be available from 2011 onward (HERE 2013).

In 2017, the second NPMRDS contract was awarded to the teams at the University of Maryland and at INRIX. The RFP for this acquisition outlined data requirements and defined restrictions for data use (FHWA 2016). The RFP stated that probe-speed data of interest were required to be observed from probe vehicles and to include average travel times and average speeds in 5-minute increments for all vehicles and freight trucks. Imputed, predicted, or historical data could not be included. A path-based processing approach was allowed, and detailed explanations with regard to how the employed approach would work and when to expect it to be used were required. Specifications for geographic coverage were provided in a detailed list. FHWA stated that it would use absolute speed error to evaluate probe data accuracy. Supplied data had to meet the frequency and accuracy requirements.

FHWA clearly defined data use and sharing in the RFP. It stated that "FHWA, public transportation agencies, and officially designated representatives shall have the right to use the vehicle probe data provided under this contract for transportation planning and operational analyses, service and data quality validation analyses, and all other internal organization applications." FHWA also required a perpetual license to access the data set and that the same access be granted to "state DOTs, MPOs, other operating administrations at U.S. DOT, and Federal partners involved in transportation analyses," as well as contractors performing work on their behalf. It also held that authorized users would reserve the right to share aggregated results from the data set with the public. The vendors were asked to specify any additional restrictions to protect the commercial value of their data.

To ensure the maintenance of data quality throughout the contract period, FHWA mandated submission of a data validation plan that would detail the vendor's approach to implementing a viable data quality assurance methodology. Details of requirements are as follows:

- The plan shall be consistent with data requirements set forth in the RFP, such as 5-minute frequency, data accuracy measured by the absolute speed error and error bias, and temporal and spatial coverage.
- The contractor shall be responsible for developing and implementing a valid and reliable data validation methodology.
- The contractor shall perform data validation and assessment and also provide quarterly reports summarizing the results of data validation and what and how actions should be taken to meet the performance requirements set by FHWA.

The three criteria on which proposals were to be judged included technical competency, evidence of past performance, and cost–price, with each factor being weighted differently in the assessment. Technical competency was more critical than evidence of past performance, while the combined weight of these criteria approximately equaled that of price.

Numerous studies and analyses have been conducted for various applications since the NPMRDS became available. FHWA has been applying NPMRDS data to produce the quarterly *Urban Congestion Report* that profiles the most recent congestion and reliability trends at the national and city level (FHWA 2017).

Practice at I-95 Corridor Coalition

The I-95 Corridor Coalition Vehicle Probe Project (VPP) began in 2006 with the goal of providing real-time traffic monitoring along the entire corridor rather than collecting data along discrete segments of the corridor. The initial RFP did not specify what technology should be used, but it instructed that the selected technology should meet the desired requirements for systems such as ATIS and ATMS. INRIX was awarded the contract for the VPP project in late 2007, with the initial launch in 2008. In 2009, data validation was finalized to ensure the quality of VPP data that were utilized (Young 2007).

The RFP specified detailed data quality requirements, including accuracy, availability, latency, and granularity (University of Maryland College Park 2013). Bluetooth data were to be used as the ground truth to determine many of the data quality metrics. More specifically, the accuracy was reported based on average absolute speed error and speed error bias between the probe speed and Bluetooth speed. The data availability was determined as the percentage of uptime of the data service excluding the scheduled system maintenance and should be at least 99% of the time. The latency was defined as the time difference between the onset of a slowdown, according to the Bluetooth data and probe data. A slowdown was identified as when traffic speed drops 20 mph within 10 minutes, and the condition lasts for at least 15 minutes. The average data latency was calculated by averaging the latency of individual slowdowns identified in the validation data set. It was mandatory to have a maximum data latency less than or equal to 8 minutes on freeways and highly desirable to have a maximum data latency less than or equal to 5 minutes on freeways and 8 minutes on arterials. Finally, the spatial granularity was required to be 0.3 miles on urban roadways and 1 mile for rural freeways, with a required temporal granularity of at least 5 minutes.

The RFP stipulated that data ownership would remain with the contractor, with the VPP retaining a perpetual right to use the data for purposes of internal applications and for archiving all the data. All data licensees were to sign a data use agreement. The RFP also specified that data licensees would work with the vendor to prevent their unauthorized use. Licensees would agree to prevent the alteration of restricted use notices, properly label data as proprietary information, and store and transfer data using mediums that "provide reasonable protection against their unlawful copying and unauthorized access and use." As a licensee of the data, users would not be permitted to sell or transfer the data to any party without making the vendor aware of the transaction. This would give the vendor an opportunity to prevent disclosure of proprietary data (I-95 Corridor Coalition 2015).

To ensure the quality, timeliness, and consistency of travel time and speed data, VPP implemented an approach similar to the service-level agreement, which articulated that the payment would be tied to data quality and accuracy validation results. If the provided data met all the minimum quality requirements specified by VPP, full payment based on the fix-priced task order would be made to the contractor. However, if data failed to meet the requirements, payment would be reduced based on the Coalition's policy. The Coalition anticipates using a similar method for arterials, but research is still ongoing.

Extensive validation work has been performed by VPP. The 2009 validation summary report discussed the process for validating probe data (Haghani et al. 2009). First, the standard error of the mean was calculated for the ground truth data to create an uncertainty band around observations. Next, two measures—the average absolute speed error and the speed error bias—were developed to compare VPP data to ground truth data. From 2009 to 2014, only INRIX data were used for monitoring. In 2014, efforts to validate the HERE and TomTom data sets began; at the same time the validation of HERE data began in Pennsylvania. It was the first reported validation of this kind.

Past Studies Involving Data Procurement

Private Sector Data for Performance Management

Turner et al. (2011) conducted a synthesis study for FHWA that focused on the technical and institutional issues associated with using private-sector travel time and speed data for performance management. Important topics covered in the study pertaining to the data procurement are summarized as follows:

- Essential data elements that should be included in private-sector data for performance measurement were identified, including date and time stamp, roadway link identifier, roadway link length, and travel time and speed. To ensure consistency, they recommended that a standard definition of time be used to eliminate confusion in different time zones and during daylight saving time and that an attribute table be provided for link location references.
- Metadata providing supplementary information about primary data elements could be particularly useful in understanding how private-sector data are collected and processed. Example metadata elements included probe-vehicle sample size, travel time or speed standard deviation, confidence indicator, and gap-filling indicator.
- Data products and services provided by major private-sector vendors at the time of the study were gathered and presented. Identified vendors providing travel time and speed products included AirSage, ATRI, INRIX, HERE (previously NAVTEQ), TomTom, and TrafficCast.
- Although not directly intended for data procurement, the study outlined three data quality assurance methods that can provide helpful guidance on sample data validation during the procurement process. The first approach involves, principally, statistical analysis of the data and metadata to develop an overall understanding of data and to identify suspicious data points. This approach is the least costly option but often does not result in a definitive accuracy assessment. The second approach requires comparing private-sector data to trusted public-sector data (e.g., fixed-location sensor data). However, different data collecting mechanisms and spatial segmentations may result in some uncertainty. The third and most costly approach is to install monitoring devices, such as Bluetooth readers, to collect benchmark data that can ensure high accuracy. The study suggested the use of this approach at locations that are most prone to have uncertainty in data accuracy and when there is no other data source available.
- Various data rights and legal issues—including but not limited to data licensing, pricing, open records requests, and privacy issues—were also discussed. Similar issues will also be discussed in the next section of this chapter, with frequent reference to this study.

NCHRP Project 70-01: Private-Sector Provision of Congestion Data

NCHRP Project 70-01 recommended that agencies seeking third-party travel-time data adopt a competitive demonstration approach to procurement (Smith et al. 2007). The goal of this strategy is to foster competition among data service providers to minimize risks to agencies as

they gradually shift to licensing data and service from a third party. This approach consists of the following four steps:

- Step 1. Issue RFP. A comprehensive, detailed set of requirements should be included in the RFP that describe the data and services that transportation agencies intend to purchase.
- Step 2. Develop short list. Agencies should consider the following criteria when evaluating proposals: public-sector references; proposed cost structure; demonstrated ability to meet requirements; and demonstrated ability to provide a long-term, stable service. Vendors meeting an agency's criteria should be placed on a short list for further consideration.
- Step 3. Request competitive demonstration. Procuring agencies should ask short-listed vendors to provide sample traffic data as specified in the RFP and to demonstrate their ability to meet the spatial, temporal, and quality requirements.
- Step 4. Negotiate agreement. Agencies should reference other examples to determine if costs proposed by private vendors are fair and reasonable. Negotiations should endeavor to obtain a fair price for the data service.

Pilot Procurement of Third-Party Traffic Data

This study, conducted by California PATH, sought to acquire disaggregated GPS probe-vehicle data (Bayen et al. 2013). The final report summarized the past practice for procuring third-party data and includes the documents used for PATH's data acquisition. The study recommended that before circulating an RFP, it is appropriate to first issue an RFI to collect and solicit information from the industry. The responses can then be used to refine a data request and develop targeted data specifications (e.g., spatial, temporal, quality, volume, and method of delivery). RFIs provide agencies the opportunity to ask questions about the methods vendors use to collect and process data, as well as their strategies for removing outliers from data. Since the PATH research team intended to obtain disaggregated speed data, it was specifically concerned with the possibility of an individual vehicle's path being identified from the data and the measures taken by vendors to protect such information.

An RFP should be carefully designed to attain a balance between scientific rigor and simplicity. It should be specific enough for procuring agencies to get the data they need but not so complex that it will discourage vendors from submitting proposals. When the PATH team issued its RFP, there was no pricing model available for disaggregated probe data. As a result, the team defined its own pricing model in the RFP based on the cost per highway segment for the duration of the contract. The criteria used for vendor selection included: (1) Management (previous experience and ability to meet the requirements); (2) Data information (quality, coverage, and amount); and (3) Technical aspects such as data collection experience, data procurement and validation expertise, and knowledge of traffic information systems.

The goal of contract negotiation is to align the legal, regulatory, business, and technical requirements of a vendor and public agency. The agreement PATH struck gave it the ability to retain perpetual use rights for the data and combine the data with data from other sources. PATH agreed not to reveal the vendor's data to its competitors.

Based on the PATH team's experience, the report recommended that technical users of data meet with procurement staff early in the process so they have sufficient time to become familiar with the ongoing data services. Contracts should clearly articulate an exit strategy. A contract should explicitly state the procedure for terminating the agreement if the data or services received do not match what was requested in the RFP.

Applying Archived Operations Data in Transportation Planning: A Primer

While this study, conducted for FHWA, principally sought to outline guidance for transportation agencies on the use of operations data for planning applications, the authors provided

some suggestions to agencies wanting to procure data from private vendors (Bauer et al. 2016). Agencies considering whether to obtain third-party data must closely attend to the contract language specifying acceptable uses. Often, agencies procure data without specifying terms of use in the RFP, which cedes authority to the data providers to prescribe the terms of use. When this occurs, the terms of use can be overly restrictive and not in the best interest to the agency; or the agency may not be able to archive or share the data with partnering agencies.

Agencies should propose their own terms of use and let the private vendor respond to and price the data accordingly. Agencies can refer to language adopted by the I-95 Corridor Coalition in its RFP and use agreement with data vendors as a starting point, the details of which have been discussed in the previous section of this chapter.

Pack and Ivanov (2017) offered similar suggestions for negotiating terms of use on third-party data contracts. They recommended that agencies consider adding payment terms based on the quality and availability of the data feed. This objective can be achieved by setting aside funds in the procurement budget for an independent evaluation of the data.

Legal Issues

Harnessing information gathered from the study team's literature review, this section discusses legal issues involving the procurement of proprietary data—including licensing rights (especially data use and sharing restrictions), compliance with open records laws, and privacy concerns.

Licensing Rights

Historically, transportation agencies have deployed their own equipment and personnel to collect data. Under these circumstances, agencies own the data and, therefore, have unlimited rights to use and share them. As agencies start to acquire data and services from third parties, they must navigate the previously unfamiliar landscape of licensing data. Unless the contracts agencies sign with third-party vendors explicitly state otherwise, in general, agreements are for licensing data, which means the agency does not own the data outright. As stated in *Private Sector Data for Performance Management*, in licensing data to agencies, private vendors are merely giving them permission to use data for various applications specified in the negotiated agreement (Turner et al. 2011). While such an arrangement introduces challenges and potentially limits the number and type of applications an agency can utilize data for, purchasing data outright from vendors is much costlier than merely licensing it. When an agency issues an RFP to obtain data, it must be specific about its intended uses for the data and with what entities it can share licensed data.

Under data licensing agreements, the extent to which agencies can share data with external stakeholders is dictated by use permissions outlined in the use agreement. Typically, the use of raw data is restricted to the entities and people specified in the contract. Most of the contracts reviewed by the study team prohibited sharing raw data with other agencies unless otherwise specified therein. Sharing derivative work, summary statistics, and reports with other agencies and the public is generally allowed.

Private Sector Data for Performance Management also addressed the status of data licensed from private vendors under federal law (Turner et al. 2011). While it touched on state and local open records laws, the purview of its discussion was mostly restricted to the implications of federal law. If the federal government entirely funds the production of data, it retains unlimited rights to them, meaning it is able to "use, modify, reproduce, perform, display, release or disclose the

data to anyone and for any purpose" (Turner et al. 2011). These rights also extend to technical data (e.g., computer databases or software documentation). Conversely, the federal government enjoys limited rights to data if they embody trade secrets or are commercial or financial and confidential or privileged to the extent that they were developed with private funding (Turner et al. 2011). When the federal government possesses limited rights, it cannot legally release data to parties outside the government unless it reaches an agreement with the vendor. Public agencies, regardless of level of government, typically do not own nor can they freely distribute data unless they pay for the full cost of data collection. Accordingly, the report recommended establishing clear terms in procurement documents with regard to the circumstances and conditions under which data can be released to and used by third parties.

Open Records Laws

Federal, state, and local public agencies in the market to license data from a private vendor must also grapple with questions with regard to their data usage rights and whether the data they acquire would be subject to open records laws or Freedom of Information Act requests. Many private vendors prefer restricting access to data they have collected, processed, and organized. However, depending on the jurisdiction, laws may dictate that proprietary data—even if their collection were not entirely paid for using government funds—can be inspected and used by the public. The study team reviewed the implications of open records laws for agencies seeking to license data from private vendors, focusing on a 2011 FHWA report and the open records laws in Arizona, Georgia, Kentucky, Ohio, and Wisconsin—states that are discussed in Chapter 4 (Turner et al. 2011). The summary of state and federal laws is not exhaustive. While the information presented here is broadly representative of how proprietary data are treated under federal, state, and local laws, agencies preparing to license data should thoroughly and independently assess the ramifications of state and local statutes, and, if necessary, seek legal counsel to determine whether data would be subject to release under open records laws.

Turner et al. (2011) observed that there is considerable variation in how federal and state governments address open records laws and Freedom of Information Act requests. The report noted that some agencies have licensed proprietary data sets, and that proprietary data may be protected by law from public disclosure. To avoid wrestling directly with open records laws, some agencies have used outside contractors to aggregate data and produce summary reports for public distribution. The justification for this arrangement is that—because the agency never possesses or controls the proprietary data—it may be shielded from public requests. Some states are changing their laws so that this justification may no longer apply. Florida has recently enacted a law that renders all data processed through and handled by subcontractors working for state agencies as subject to open records requests.

To present a fuller picture of how various states deal with open records laws when licensing proprietary data, the study team compiled information on public records laws in states that are the focus of case examples in Chapter 4 (Arnold 2010). Most states have laws on the books that grant the public the right to inspect public records. However, most also have affirmed—through explicit statutes or judicial opinion—that data classified as proprietary or a trade secret can be exempted from public records laws.

Public records are open to inspection by any person in Arizona (Arizona Revised Statutes § 39-121). If the custodian of records determines records should be withheld for any reason, the agency provides the requester with an index of records or categories of records that have been held back, along with the reason for their being withheld [Arizona Revised Statutes § 39-121.01(D)(1)]. A person who is denied access to records may appeal the decision through

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a special action in superior court. While the public can inspect bids and proposals after a contract has been awarded, a vendor has the option of designating material in their bid documents as trade secrets or as proprietary. If the vendor makes this designation, the State of Arizona preserves the confidentiality of bid documents and related material. Arizona's public records laws do not explicitly exempt trade secrets and proprietary information from public inspection, but state courts have granted exceptions—for example, when records are confidential or their release would be counter to the state's best interest. Trade secrets have also been protected by the confidentiality exception to disclosure. A 2009 opinion by the Arizona Supreme Court *(Lake v. City of Phoenix*) held that "if a public entity maintains a public record in an electronic format, then the electronic version, including any embedded metadata, is subject to disclosure under [Arizona's] public records laws."

Georgia's Open Records Act (Official Code of Georgia Annotated § 50-18-70), which covers all state agencies and political subdivisions, holds that "there is a strong presumption that public records should be made available for public inspection without delay." Public records include documents, papers, letters, maps, books, tapes, photographs, computer-based or -generated information, and similar material that is prepared and maintained or received as part of a public office or an agency's operation [Official Code of Georgia Annotated § 50-18-70(1)]. Bids and proposals likely fall under the Open Records Act, although trade secret protections may apply. There are several circumstances under which the Open Records Act does not apply. Most pertinent to the release of proprietary data, the law exempts any trade secrets the state obtains from a person or business. If a vendor wishes to keep data protected under the trade secrets clause, the vendor must submit and attach to the records an affidavit affirming that the records constitute trade secrets. But if an agency determines information does not qualify as a trade secret, it will notify the party submitting the affidavit that it intends to disclose the information. In turn, an entity may petition a superior court to block the disclosure of records.

Kentucky's Open Records Act (Kentucky Revised Statutes § 61.870–61.884) states that all public records are open to public inspection unless otherwise specified in the statute. Bid and proposal information may be viewed after bids have been opened, although Kentucky law does not take a position on whether bids and proposals for other procurement methods constitute public records. Kentucky Revised Statute § 61.878 specifies that records that are excluded from the application of Kentucky Revised Statutes § 61.870–61.884—including records classified as confidential or proprietary—can be inspected if a court of competent jurisdiction grants access.

Ohio's public records can be inspected by any person (Ohio Revised Code § 149.43). State law does not explicitly address whether competitive bids or proposals are subject to open records laws. However, competitive bids are opened in public. Documents may be exempted from this requirement if they include trade secrets. Likewise, Ohio's Uniform Trade Secrets Act (Ohio Revised Code § 1333.61–§ 1333.69) prohibits the unauthorized disclosure of trade secrets, which encompass "information, including the whole or any portion or phase of any scientific or technical information, design, process, procedure, formula, pattern, compilation, program, device, method, technique, or improvement, or any business information or plans, financial information, or listing of names, addresses, or telephone numbers" that both derive independent economic value from not being publicly available and are the subject of reasonable efforts under the circumstance to maintain its secrecy.

Wisconsin's Public Record Law (Wisconsin Statutes § 19.31–19.39) establishes as standard complete public access to government records and documents. The state defines records as any materials on which information is recorded or preserved regardless of physical form or characteristics and that has been created or is preserved by an authority. State agencies deny access to records only in rare, exceptional circumstances. Bids and proposals likely qualify as records, although restrictions are placed on the release of trade secrets. The Wisconsin Supreme

Court has observed that—along with explicit provisions that limit the release of public records—state courts have recognized other limitations on disclosure, "including the requirement that the harm to the public should be balanced against the benefit of disclosure to the public" (*State v. Beaver Dam Area Development Corporation*). Furthermore, Wisconsin Statute § 19.31(5) states that authorities may withhold a record or any portion thereof if it contains materials that qualify as a trade secret under the Uniform Trade Secrets Act. The Wisconsin DOT worked through the legal implications of declaring proprietary vendor data as a trade secret when it licensed freight performance measurement data (see Chapter 4).

Privacy Concerns

When licensing proprietary data, privacy concerns are a final matter to consider. If the traffic data that a public agency intends to purchase, license, use, or disclose has been anonymized, then the proposed transaction is unlikely to trigger legally recognized privacy rights under current law (Turner et al. 2011). Conversely, if an agency plans to license or purchase personally identifiable information, then constitutional, statutory, and common law privacy rights designed to guard against the intrusion created by the unwarranted and unauthorized distribution of personal information become implicated.

CHAPTER 3

Practices on Proprietary Data Acquisition

This chapter discusses the practices transportation agencies use to acquire proprietary data. The findings are drawn primarily from survey responses submitted by representatives from state DOTs and MPOs. Findings from follow-up interviews and literature reviews are integrated to facilitate the discussion. The topics covered in this chapter include:

- Acquisition decisions pertaining to motivations, obstacles, budget, and DBP;
- Procurement process involving the development and issuance of RFPs;
- Use agreement pertaining to data-use restrictions, sharing policy, and legal concerns;
- Use experience with regard to a wide variety of data types discussed in Chapter 2; and
- Peer advice with regard to data acquisition and use.

Acquisition Decision

This section focuses on agencies' motivations and concerns with regard to proprietary data acquisition, as well as the roles DBPs and budgets play in acquiring data.

Driving Factors

As the previous chapter highlighted, the availability of proprietary data affords agencies unprecedented opportunities to meet their data and business needs. When asked about what the main driving factors are behind the decision to acquire proprietary data, 32 agencies responded. The summary of the responses broken down by different factors is illustrated in Figure 6. The top two driving factors were unmet data needs and new insights provided by the data. Each of these justifications had 17 responses (53.1%). An example is that transportation agencies generally need to monitor transportation system performance but may lack the resources to collect traffic data on roadways other than major corridors, areas in which proprietary data prove very valuable. Similarly, agencies have had difficulty collecting truck data; this problem has been mitigated—and, in some cases, resolved—through the availability of proprietary trucking data. One example of the new insights agencies have generated through proprietary data is the use of crowdsourced cycling data to better understand bicycle use on the system and inform infrastructure improvement decisions.

Meeting new program needs, achieving cost-effectiveness, and complying with new legal requirements were also common motivations for licensing proprietary data. The MAP-21 requirements appear to be a primary driver for some agencies to look to proprietary data for performance monitoring and reporting. Other factors—such as the rich information provided by the proprietary data, knowledge of data suppliers, active engagement from vendors, and positive experience from other agencies—can also play an important role in spurring some agencies' data acquisition decisions.

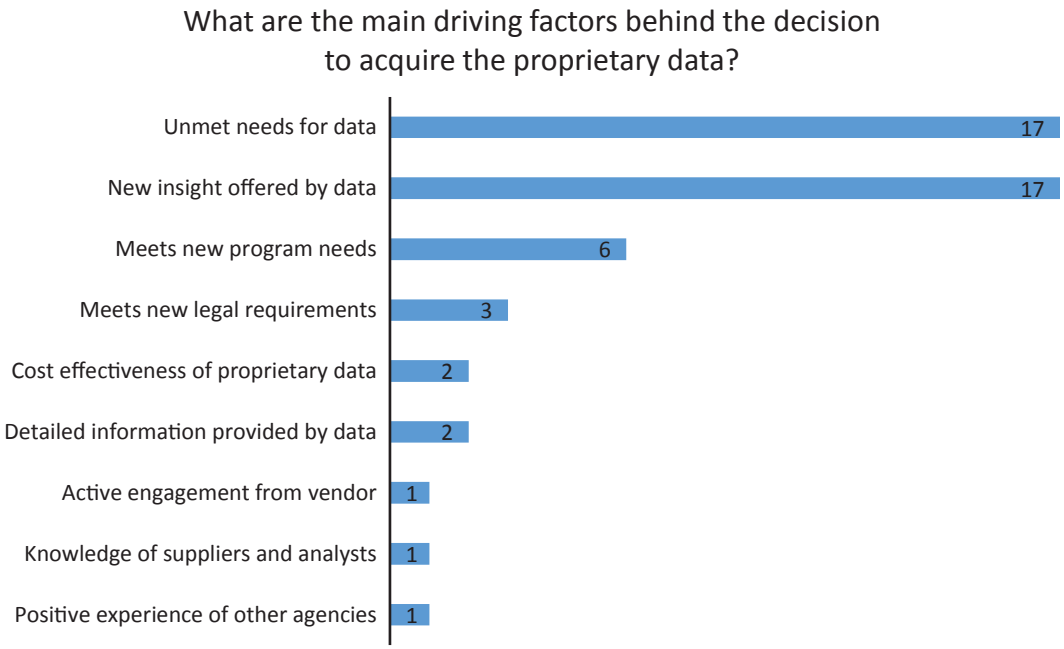

Figure 6. Driving factors behind agencies' decision to acquire proprietary data.

Main Concerns

When asked about the aspects of proprietary data agencies find most concerning, 29 responses were received. Figure 7 summarizes the responses by different concerns. Data quality was the most frequently cited concern, with 23 responses (79.3%). This is understandable considering that agencies have only just begun to use proprietary data, and many of them are still working to verify and validate data. Another contributing factor is related to the lack of transparency in proprietary data with regard to the data sources and processing methodology used by vendors (Lemp 2017A–2017C). Also, because proprietary data are often crowdsourced, probe

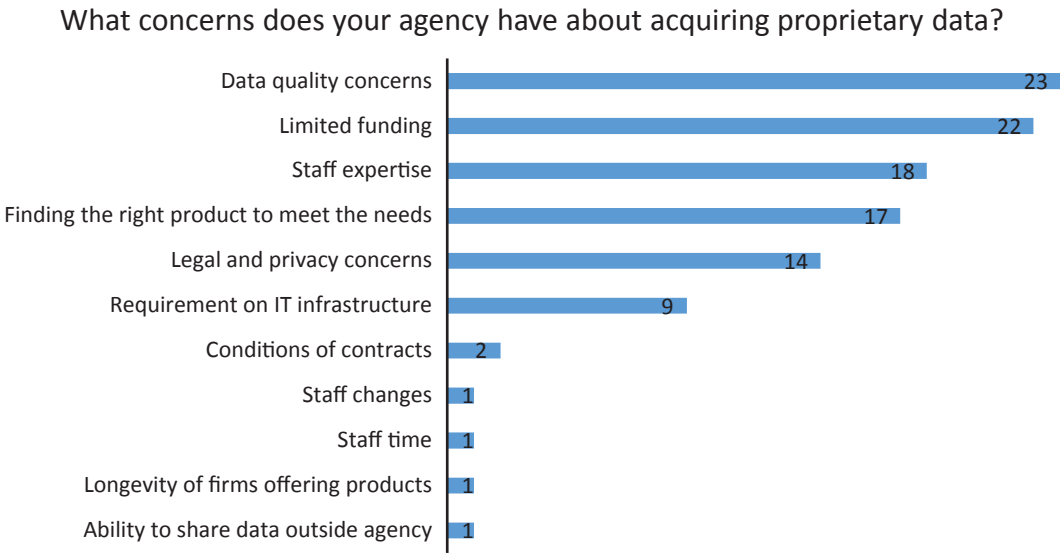

Figure 7. Concerns agencies have with regard to proprietary data.

penetration rate plays a critical role in data quality. Some agencies expressed concerns about low sample sizes on roadways in lower functional classes.

Funding the acquisition of proprietary data imposes a financial burden on agencies, and 22 respondents (75.9%) cited this circumstance as a main concern. Data licensing is a relatively new practice for many agencies, and it is critical to justify data purchasing by demonstrating their value and to gain internal support. Agencies have found data licensing to be particularly onerous because of funding restrictions. For instance, large purchases must go through legislative budget requests in Florida.

At least 18 states (62.1%) mentioned that staff expertise was a main concern. Because the proprietary data use different data definitions and are often massive in size, data integration and analysis may be challenging. One example is that a respondent performs GIS integration with vendor-provided street maps each year. But when the local staff changes, familiarizing everyone with the integration process and determining who should be responsible for dealing with new acquisitions and archiving data can be cumbersome.

Other sources of concern included the challenge of selecting data products appropriately matched to agency needs (17 respondents, or 58.6%), legal and privacy issues (14 respondents, or 48.3%), and the added IT infrastructure required to handle the immense data storage and analysis needs (9 respondents, or 31%). Less frequently noted concerns included the conditions imposed by contracts, the longevity of vendors, and the ability to share data with parties outside the agency.

Budget

When asked if agencies have an annual budget for the data acquisition, 29 states responded to the question. Of those, eight states (27.6%) responded with "Yes." Two respondents specifically indicated that their funding comes from the ITS or Operations budget. Nineteen (65.5%) states reported that they do not regularly allocate a specific portion of their budgets to the acquisition of proprietary data. The reasons for this omission vary among agencies. One respondent noted that their state places strict restrictions on data purchases. Often, purchases must be approved through the legislative budget process. Another explanation is that many agencies make only a few purchases, so they see little purpose in allocating a set amount for data. Several other respondents commented that data are acquired as needed and covered by specific project funding. One respondent indicated that their DOT pools resources across units and divisions for data purchases and established data-sharing agreements so that they can all enjoy access to data. Two states are currently developing annual budgets to maintain data purchases or subscriptions.

Data Business Plan

A DBP is an institutional plan that links agency business needs, programs, and processes to data products, services, and management systems. It helps an agency to identify its current and future data needs and to prioritize data investments accordingly. DBPs play an important role in coordinating available resources; facilitating data collection, processing, analysis, and sharing; and transitioning to more data-driven, transparent, decision-making models. The study team asked agencies whether they have a DBP in place and received 38 responses. As shown in Figure 8, six responding agencies (15.8%)—Alabama, California, Florida, Georgia, Minnesota and Oregon—have DBPs. Fourteen agencies (36.8%) indicated that they are in the process of developing DPBs, while 18 agencies (47.4%) do not have DBPs or have no plans in place to prepare them.

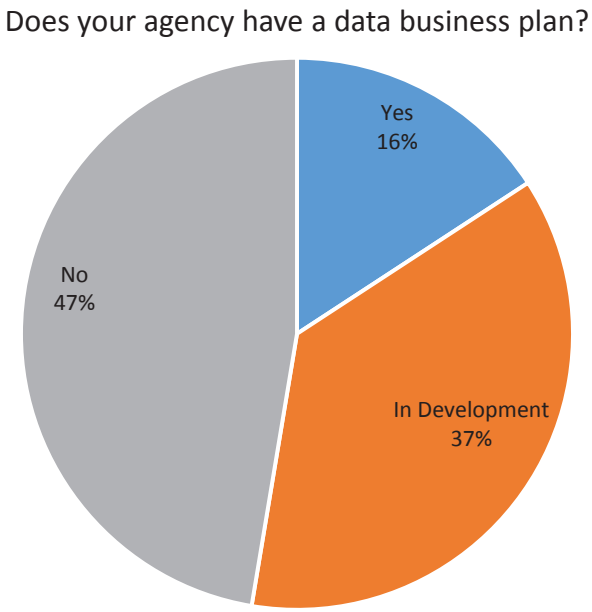

Figure 8. Agencies with DBPs.

Oregon and Minnesota's DOTs provided the study team with their respective agency's DBPs. Both plans underscored proprietary data as an alternative to collecting and managing data in-house. The Oregon DBP acknowledges that "advances in technology and emerging private-sector products provide new opportunities" (Oregon Department of Transportation 2016). Minnesota's DBP suggests establishing "processes to regularly assess what data are needed, what data can be eliminated, what data can be provided internally and what data can be obtained from other public and private sector sources" (Minnesota Department of Transportation 2011). Both agencies have begun working with proprietary data to gain new insights into travel patterns and conditions. Evaluations are still needed to identify the best uses of proprietary data. The DBPs contained no specific guidelines or instructions on the process of acquiring proprietary data. Nonetheless, the fact that these plans identified proprietary data as offering an alternative way to fill data gaps or meet business needs represents recognition and acceptance of proprietary data at the agency level.

Procurement Method

The procurement process plays an essential role in successfully acquiring the right proprietary data to meet an agency's business needs. This section provides details on procurement methods adopted by transportation agencies for acquiring proprietary data.

Issuing RFPs

The survey asked respondents to comment on which parties are involved with data acquisition. Responses with regard to 53 data sets were received. Thirty-seven data acquisitions (70%) were handled directly by state DOTs. Ten data acquisitions (19%) were completed through consultants (including universities). Both the state DOT and a consultant were involved in acquisition of the remaining data sets. The responses also indicate that at least 28 RFPs were issued by agencies, while at least seven RFPs were issued by consultants. Some of the data sets were acquired without issuing an RFP.

Requirements in RFPs

An RFP should define the data items that agencies want to acquire; requirements on data granularity and quality; instructions that proposers are to follow when submitting proposals; and terms of use, sharing, and archiving. An RFP should clearly convey the agency's needs and requirements in a manner that also encourages vendors to respond. Seven states provided sample RFPs in their responses. They are reviewed and summarized in this section. Most RFPs provided to the study team were for speed or travel-time data procurement, yet the language should be transferable to RFPs focused on other data products.

Data elements Table 2 summarizes data elements included in the seven RFPs, including data accuracy, latency, granularity, delivery method, integration, and archiving. For example, Ohio DOT was interested in both real-time and historical speed data and required that historical data be provided through RITIS. Mandatory data elements are specified in the RFP,

Table 2. Data requirements.

Requirement	Utah	Missouri	Ohio	Michigan	Wisconsin	Kentucky	Arizona
Data and Service	Real-time and historical data, analytics tool	Real-time and historical data	Real-time and historical data	Real-time traffic data, analytics tool	Real-time speed data	Historical speed data	Various traffic services and information
Cloud–Web-Based Application	Unlimited DOT users and downloads, administrative right by DOT	View real-time data; support up to 100 users and scalable to 500 users, as needed	Historical data must be provided through RITIS	Unlimited users by state and contract employees			Seek information from vendors
Data Elements	Travel time, speed, delays, confidence score, trip table reports, congestion and reliability measures, user delay cost, and so on	Speed, travel time, status flag, quality indicator, travel-time index, PTI, buffer time, and user delay costs	Speed data must contain a timestamp, data point status, confidence, and traffic speed reading	Speed, travel time, and confidence interval; ability to incorporate NPMRDS and various DOT data	Median and mean speed, a status flag, and confidence score	Free-flow speed, speed, and standard deviation; sample count or equivalent indicator of confidence	Seek information from vendors
Data Delivery	XML[a] format	XML format	Specified XML format and preferred TCPIP protocol	XML format, CSV[b], and transfer by HTTP or other protocol	XML format; a private website acceptable if beneficial		XML format; provide data access methodology
Temporal Granularity	5-minute intervals, maximum 5-minute latency, and update in 1-minute intervals	Update every 5 minutes, maximum 5-minute latency; minimum 15-minute interval for historical data	1-minute intervals, update every minute during 5 a.m.–9 p.m. and 3 minutes during 9 p.m.–5 a.m.	Update every 2 minutes; maximum 10-minute latency	1-minute intervals; maximum 1-minute latency	5-minute interval	Update every minute
Spatial Granularity	TMC at a minimum; shorter segmentation desired	Definition shall be based on logical breaks; provides link-length guideline by urban–rural and freeways–arterials		Segment definition shall be based on logical breaks	Segmentation is the responsibility of the vendor and shall be performed in cooperation with DOT	On roadway links rather than the TMC links	

Table 2. (Continued).

Requirement	Utah	Missouri	Ohio	Michigan	Wisconsin	Kentucky	Arizona
Coverage	Statewide	Select roadways	Statewide	Freeways	Roadways and routes surrounding the I-39 construction area	Statewide	Statewide
Data Manipulation	Not be a blend of live and historical data nor historical data only	No estimates or projections based on historical data; vendor may integrate DOT sensor data to supplement existing data feeds		Allowed	Allowed, but reflected by the status flag	Must not be modeled to fill the gaps when and where no probe data exist	Predictive traffic data along with the historical data and assurance of the prediction quality
Data Quality	Accuracy: At least 90% accurate or have a maximum error rate of 10%; Availability: At least 90% available between 6 a.m. and 10 p.m.; Quality: fitness of data for all purposes that require such data	Accuracy: Required for vehicle flows exceeding 500 vph[c]; Availability: At least 99%; Reliability: At least 95% of all segments at all required time-reporting intervals	Accuracy: Plus or minus 4 mph or more accurate; Availability: Must be available for a minimum of 99% of the time for a billing period. In a given day, at least 97% of data must be provided.	Accuracy: Absolute average speed error and average speed error for each speed bucket; Availability: At least 99.5%; Completeness: At least 95% of all segments at all required time-reporting intervals		Availability: Based on specified resolution (may separate by day and night, car and truck); System coverage: Based on roadway functional classification	
Data Archive	Shall be allowed to archive real-time data by DOT	DOT has the right to indefinitely archive data; vendor provides a web-based archiving service	DOT reserves the right to archive speed data	All data provided shall be available for archiving to be used in future DOT uses	DOT retains the right to archive and use the data perpetually for analysis and research purposes		Jurisdictions should have the ability to archive all real-time traffic data for future use
Integration	Not required, but desirable for vendors to provide information with regard to their past data integration services, including timeliness and level of effort for these services	The offeror shall describe the typical manner in which data may be integrated into ATMS and DOT-sanctioned websites		The contractor is required to integrate real-time data from DOT MVDS[d] in existing formats or schemas into the contractor's real-time data feed	The vendor shall provide services to assist with integrating real-time traffic data into the current Statewide Traffic Operations Center TransSuite ATMS for DOT and its members		The offeror shall describe data standards and how data can be integrated with Arizona DOT; Maricopa County DOT; and local applications, such as travel-time dissemination

[a]XML = Extensible Markup Language.

[b]CSV = comma-separated values.

[c]vph = vehicles per hour.

[d]MVDS = microwave vehicle-detection system.

as well as data delivery format. The data were to be acquired for the whole state and needed to be in 1-minute intervals with 1- and 3-minute update frequencies during the 5 a.m.–9 p.m. and 9 p.m.–5 a.m. periods, respectively. A copy of the RFP can be found in Appendix D2. The Arizona DOT utilized a somewhat different approach in that its RFP enumerated all the data services the agency was interested in and asked vendors to provide information on whether and how they plan to offer those services. A complete copy of the Arizona RFP can be found in Appendix D4.

Third-party web-based applications have received increasing interests among transportation agencies for data analytics and storage. Five of the seven states sought such applications in RFPs. The two remaining states leveraged resources at universities.

Agencies had different requirements related to how or whether gaps in data sets are to be filled. Three agencies specifically asked that imputed, modeled, or historical data not be included in the provided data. Three other agencies allowed data imputation but held that it should only be done through careful interpretation or verification.

Specifying requirements on data integration is another important aspect of RFPs for proprietary data acquisition. Private-sector firms often use their own data and network definitions that are very different from those used by transportation agencies. This makes it a necessity for agencies to integrate proprietary data with an agency-maintained data system. Yet, many agencies find it difficult to perform data integration, which usually requires intensive efforts and staff resources. To deal with this issue, two states explicitly required vendor assistance with data integration, while three other states asked vendors to provide instructions on data integration and a narrative of the time and resource commitments needed to accomplish it.

Data validation and service evaluation The most common concern with regard to proprietary data among state DOTs is data quality. As such, RFPs often mandate data validation as part of the contract. The Utah DOT asked vendors to provide documentation on the processes and tools used to validate data. The Michigan DOT's RFP specified that it retained the right to select which data would be used for validation and that the vendor must cooperate with data validation, whether it was performed by the DOT or by an independent contractor working on behalf of the agency. Furthermore, similar to the service-level agreement concept used in I-95 Corridor Coalition RFP, Missouri and Ohio's DOTs specified the requirements of routine data inspections and evaluations. If the data inspections and evaluations produced unsatisfactory results, the agencies reserved the right to reduce their payments or even terminate the contracts.

Agencies also required vendor presentations and on-site demonstrations to clarify proposals, evaluate whether the vendor has the requisite technical capabilities to deliver the proposed data services, and determine whether the proposed data services or solutions meet agency business needs.

Cost proposal There is no universal pricing model for proprietary data acquisition. Models vary across vendors, and agencies also have different preferences. Four pricing models were identified in *Private Sector Data for Performance Management*, which are based on mileage covered, population, number of users, or a percentage of analysis cost (Turner et al. 2011).

Among the RFPs reviewed by the study team, the Arizona DOT required vendors to submit a detailed cost model for statewide, regional, and corridor data, while KYTC asked vendors to provide a fixed price but also encouraged vendors to submit alternative financial proposals.

Given that the cost proposals of different vendors can be structured in dissimilar ways, some agencies prefer to define specific requirements for cost proposals up front in RFPs so that they

Table 3. Missouri DOT template by start-up and recurring cost.

	Pricing for Defined Data Sets		
No.	Data Packages	Start-Up Cost (if applicable)	Recurring Subscription (per year)
1	Data Set A (134.2 miles)		
2	Data Sets A and B (309.0 miles)		
3	Data Sets A, B, and C (532.8 miles)		
4	Data Sets A, B, C, and D (640.6 miles)		
5	Data for the entire state		

have a common basis to compare proposals. The Utah DOT requested a cost proposal with separate costs for each item, including real-time data, historical data, analytics tool, and professional service. Real-time data were further partitioned into two groups (i.e., interstates, other freeways and expressways, and other principal arterials in one group and minor arterials and minor collectors in the other group). The Missouri DOT required cost breakdowns by start-up cost and recurring subscription, which is similar to the practice used by the I-95 Corridor Coalition. Vendors received a pricing table (Table 3) to structure their cost proposals. The pricing per centerline mile model (Table 4) was also used in case the agency decided to only purchase portions of a data set given the budget available to them.

To avoid repeating the acquisition process every year or every few years, state agencies often reserve the option to extend negotiated contracts into future years. To ensure transparency and eliminate any disagreement on pricing, agencies require submission of cost proposals for future years. For example, in addition to an itemized budget for the first year, the Missouri DOT requested that vendors submit estimated costs for each subsequent year, out to the fifth year. The agency instructed vendors to specify the maximum cost increase or decrease (in percentage) for the renewal periods based on the original contract period prices. The Wisconsin DOT provided vendors a table (Table 5) so they could include price estimates for multiple items for the five optional annual renewals.

Table 4. Missouri DOT template by cost per mile.

Pricing per Centerline Mile				
Total Centerline Miles Subscribe To				
Miles	0–100	100–200	200–300	300+
Start-Up (one-time)	$_____ per mile	$_____ per mile	$_____ per mile	$_____ per mile
Recurring Subscription	$_____ per mile per month	$_____ per mile per month	$_____ per mile per month	$_____ per mile per month

Table 5. Wisconsin DOT cost proposal including future renewals.

Cost Breakdown Categories per Section 5.1.3	Base Contract Years 1–2	Renewal Option Year 3	Renewal Option Year 4	Renewal Option Year 5	Renewal Option Year 6	Renewal Option Year 7	Total
Start up	$	$	$	$	$	$	$
Customer support	$	$	$	$	$	$	$
Licensing	$	$	$	$	$	$	$
Maintenance	$	$	$	$	$	$	$
Setup/integration with current STOC[a] ATMS	$	$	$	$	$	$	$
Future integration costs with updated STOC ATMS	$	$	$	$	$	$	$
Other (add rows as necessary)	$	$	$	$	$	$	$
SUBTOTAL (100 centerline miles)	$	$	$	$	$	$	$

[a]STOC = Statewide Traffic Operations Center.

Vendor and product evaluation Twenty-seven states responded to the question with regard to whether the agency has formal guidelines to evaluate data products and vendors. At least 19 states (70.4%) have formal guidelines (Figure 9). One agency expressed interest in developing a guidance for evaluating proprietary data contracting, data-sharing agreements, and determining whether the time and effort required to pursue a pilot with new firms can be justified.

The evaluation criteria used by agencies have many commonalities. Typical criteria include data quality, vendor experience and qualifications, use restrictions, and cost. Table 6 summarizes information from RFPs on the criteria that seven agencies used for vendor and product evaluation. The percentage or points contained in parentheses for the first five states indicate

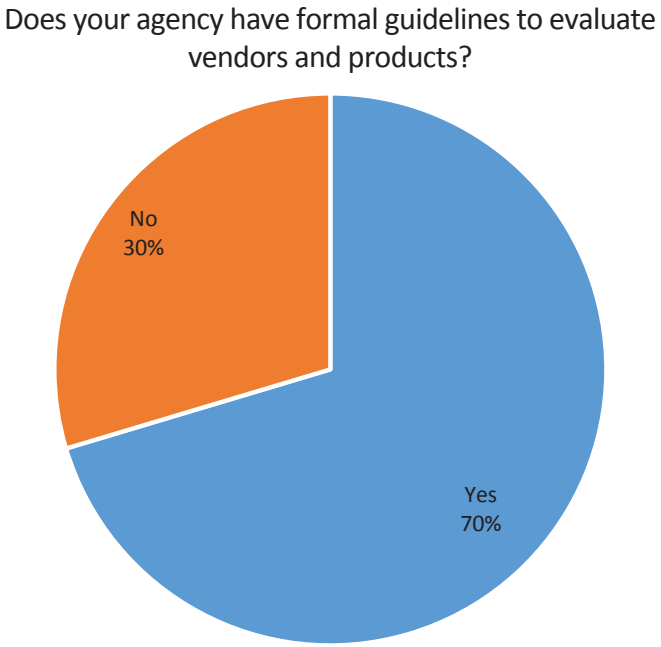

Figure 9. Product and vendor evaluation guidelines.

Table 6. Evaluation criteria from sample RFPs.

State	Proposal Evaluation
Utah	Demonstrated ability to meet the scope of work (20%) Analytics tool (20%) Performance references for similar projects (10%) System trial (20%) Price proposal (30%)
Missouri	Proposed method of performance (40 points) Offeror experience and reliability (20 points) Cost and fees (40 points)
Ohio	Organizational structure and project experience (200 points) Data service and support (300 points) Number of data points (200 points) Cost proposal (250 points) Exceptions (250 points)
Michigan	Understanding of service (30 points) Qualifications of team (40 points) Past performance (20 points) Location (5 points) Presentation (20 points) Price (40 points) Formula: low bid/bid × points assigned
Wisconsin	Proposer information and solutions (500 points) Contract requirements (250 points) Cost proposal (250 points)
Kentucky	Offeror qualifications Services defined Financial proposal Evidence of successful performance and implementation Other additional services
Arizona	Qualifications and experience of offeror Key personnel and services offered Data format Method of approach Pricing

the importance of each factor in their respective evaluation. RFPs from Kentucky and Arizona do not specify points or percentages assigned to each criterion.

Contracting and licensing requirements *Applying Archived Operations Data in Transportation Planning: A Primer* recommended a good practice in specifying terms of use in RFPs (Bauer et al. 2016). RFPs reviewed by the study team indicate that agencies are vigilant about specifying contracting and licensing requirements. Full rights to archive data for real-time cases and use data for analysis and research purposes without restrictions are often specified. RFPs generally define which parties data can be shared with. Some agencies even stipulate that they have the right to share data with state DOTs and universities in bordering states. One RFP asked vendors to describe the proposed licensing arrangement in detail and discuss the effects of the agency's intended data uses on licensing and pricing. Another state encouraged vendors to present creative approaches or alternative data set definitions and licensing rights appropriate to meet the needs stated in the RFP.

License Agreement

This section summarizes the survey responses on handling licensing and legal issues, including use and sharing restrictions and open records and privacy concerns.

Use Restriction

Most respondents stated that their agencies have no restrictions imposed on data use for the applications specified in agreements. In a handful of states, the agreements would restrict uses to particular applications and projects. For instance, one response indicated that the agency's speed data were solely for the purpose of highway performance management. Another response pointed out that truck data could only be used for monitoring and assessing truck travel patterns and truck trip modeling.

Similarly, most respondents could not cite any applications for which their agencies wanted to use proprietary data but were prohibited from doing so by licensing restrictions. This issue goes hand in hand with use restriction specifications in the agreement; many states agreed to terms that impose no restrictions on their use. The only exception was Florida, as the agency is not allowed to use acquired digital data for map visualizations, network development, and federal submissions.

With respect to data licenses, all agencies had obtained perpetual data licenses except for one state, which indicated that their licenses are not perpetual. Most states did not face any restriction on the number of users who can access data. There are, however, restrictions often placed on access to analytics tools or cloud applications. Even so, the number of authorized users in these scenarios is sufficiently high that the restrictions have not constituted a burden.

Data-Sharing Policy

Sharing agreements for raw data are usually more restrictive than those for derivative works. The amount of raw data that can be shared—and with whom—varies by agreement. In most cases, raw data can be shared with public agencies, contractors, and universities, as long as they are part of the agreement or sign a user agreement indicating that they will abide by the contract. However, raw data typically cannot be shared with the general public. Among the responding agencies, the Atlanta Regional Commission is the only one that has signed a contract that allows it to share raw data with the public (see Chapter 4).

Some agreements mandated that raw data cannot be shared with groups or people not affiliated with the licensing agency; a few agreements restricted access to individuals working on projects specified in the user agreement. For example, one respondent indicated that their agency could not share data with other MPOs or local government agencies, which greatly limited the data's utility. This example underscores just how important it is for agencies to negotiate agreements with private vendors with the most favorable terms possible.

Typically, there are few restrictions on sharing derivative works or aggregated results. Most respondents indicated these data can be shared within the agency, with groups outside the agency, and the general public.

Open Records Laws and Privacy Concerns

Half of the respondents said that their agencies have not had any experience with open records requests for proprietary data. However, a few respondents described how their agency would process this type of request. Two agencies placed explicit terms in the contract related to

open records requests. Under the terms of these contracts, the agencies are to notify the vendor when open records requests are received and the vendor would be responsible for taking action, such as defending its right in state court to preserve the confidentiality of its data.

Three states indicated that they would not maintain data records that require non-disclosure agreements. Instead, they would acquire data through third parties (e.g., universities and contractors). One respondent mentioned the passage of state legislation that places sub-contractors under the open records law, which effectively ended the practice of acquiring data through a third party. Another respondent indicated that their agency does not collect, receive, or maintain the raw data from vendors and is able to fulfill the requirements of open records laws by sharing aggregated reports or project analyses. Two respondents said their agencies would refer open records requests to their legal offices, which handle any possible conflicts between non-disclosure agreements with data vendors and the requirement of open records laws at the state level.

Sixty-five percent of the respondents indicated that privacy issues have not been a source of concern because there is no personally identifiable or confidential information in their data. Two respondents said their agencies would refer cases over privacy issues to their legal departments were they to arise. The remaining respondents said that they would not disclose data with identifying information or that access to and management of such data would be restricted to very few agency personnel to preclude disclosure.

Use Experience and Caveats

This section discusses the experiences of agencies using proprietary data. More specifically, it focuses on reported data uses and applications, caveats with regard to data, and overall satisfaction with data. Table 7 provides a summary of data vendors being used and typical data uses.

Speed or Travel-Time Data

Speed or travel-time data is the most common data item purchased by agencies, as they are used in a wide range of applications. At least 20 states have acquired speed data, with four states purchasing data from more than one vendor. Uses vary and are contingent on whether the data are real time or historical. Table 7 shows various cases of how speed or travel-time data are currently being put to use by transportation agencies. Respondents gave the speed or travel-time data an average Satisfaction rating of 8.2 out of 10, indicating great enhancements to existing applications.

The Virginia DOT represents a typical practice with use of real-time and historical data. It acquires TMC-based real-time data and INRIX high-definition network-based real-time data. The high-definition network has finer spatial granularity at a shorter link level and broader coverage compared to the TMC-based network. Both data feeds refresh every minute. These data are archived and aggregated—using the RITIS tool for TMC data and iPeMS tool for high-definition data—for further analysis. Speed data have been incorporated into numerous facets of the Virginia DOT's operations, including posting travel time to DMS, populating web maps on 511Virginia.org, conducting before-and-after studies to assess project impacts, and generating performance measures. Data use has also expanded to the Smart Scale initiative, a project-rating process adopted by Virginia DOT for project selection. Speed data contributes to congestion and travel-time reliability metrics.

Survey responses and follow-up phone interviews mentioned several caveats with regard to speed or travel-time data. Data coverage is generally sparser on arterials, collectors, and local

Table 7. Data, vendors, and typical uses.

Data Type	Reported Vendors	Typical Uses
Speed or Travel Time Data	HERE, INRIX, TomTom, RITIS, Iteris	Real time: Traveler information system, including DMS and 511; queue detection and warning; variable speed limit Historical: performance measures, demand model calibration and validation, corridor study, work zone analysis, project prioritization, traffic incident management, speed zoning
O-D Data	AirSage, INRIX, StreetLight	O-D analysis, demand model calibration and validation, turning movement analysis, special event travel behavior, detour planning
Freight and Truck Data	ATRI, Polk, Transearch, Waybill	Development and validation of freight models, corridor study, performance measurement, fleet breakdown analysis
Crowdsourced Incident Data	Waze	Traffic incident notification, slow speed notification, 511 system, traffic incident management, hurricane evacuation
Non-Motorized Travel Data	Strava	Identification of optimal bike counter locations, bike use on the system, countywide planning and programming, safety risk-factor analysis
Digital Maps and Aerial Imagery	ESRI, FleetRoute, Google, Maponics, NAVTEQ, Onterra	Spatial analysis, information sharing, vehicle routing, preliminary engineering, project delivery, outreach
Socioeconomic Data	Chainstore Guide, Dun & Bradstreet, IHS Global Insight, Infogroup, InfoUSA, TREDIS, Woods & Poole	Development of travel models, long-range statewide planning, demographic analysis, revenue forecasting models

roads because there are fewer probe vehicles sampled than on freeways. Some agencies may choose a gap-filling option when observed speeds are unavailable, but using imputed speeds may cause unexpected results. For instance, during a road closure event when actual speeds are not available, the imputed speeds may not reflect actual traffic conditions.

Latency issues with probe data have been reported, as well. In 2014, Kim and Coifman evaluated 2 months of probe data from a private vendor on an interstate corridor against loop detector data and found that the probe data tended to lag the loop detector data by almost 6 minutes. Sharma et al. (2017) reported that the average latency of probe data was about 5 minutes compared to fixed-location sensor data, with latencies varying by corridor. Those findings have very important implications for time-sensitive applications, such as traffic responsive ramp metering or queue warnings.

Probe-vehicle data are aggregated for each highway segment; not individual lanes. For urban freeways with high-occupancy vehicle (HOV) lanes, these data cannot distinguish speeds on HOV lanes from general-purpose lanes. As such, probe-vehicle data have limited application for the evaluation of HOV operations and other managed-lanes strategies.

The integration of proprietary data, which is attached to a proprietary network whose segmentation differs from the networks maintained by state and local agencies, is often cited as a significant challenge. Although vendor networks contain a wide range of information, many critical attributes needed to generate performance measures—such as volume—are not

available from them and must be obtained through the Highway Performance Monitoring System (HPMS) or other agency-maintained databases. Therefore, a need exists when proprietary data are licensed to integrate the vendor network with the existing state network so that the speed data, volume, and other inventory data can be combined and made available across the network. Four disparities between vendor and agency networks can hinder conflation: differences in linear reference systems, segmentation definitions, coverage levels, and geometries.

The Kentucky Transportation Center (KTC), in a project conducted for KYTC, developed a procedure for network conflation (Green et al. 2013). Quality assurance and quality control were performed to identify and correct any mismatched segments. Daneshgar et al. (2018) devised a workflow to conflate the HPMS used by Maryland State Highway Administration and a private vendor's TMC network. They used an iterative procedure to identify overlapping segments from the vendor's network for each HPMS segment and determine their associated percentages on the HPMS segment of interest. Manual checks were also needed for segments that may have had erroneous results as flagged by predefined criteria.

Additional concerns make network integration an onerous task. If a vendor makes periodic updates to their networks, the conflated network will need to be updated, as well. Different vendors may have different standards and practices for metadata and network segmentation; thus, if an agency wants to switch vendors, it will have to dedicate time to understand the data and updating or redoing integration. Because integration requires extensive GIS knowledge and tools, this task proves especially challenging for agencies, cities, and municipalities with limited GIS resources and assets. Three survey respondents indicated that their agencies perform integration in-house, whereas the remaining agencies sought assistance from consultants, universities, or vendors.

Origin–Destination Data

Proprietary O-D data are increasingly used by transportation agencies for traffic movement analysis, as well as for the development, calibration, and validation of travel-demand models. According to the survey results, at least 15 states have acquired this type of O-D data from major vendors, such as AirSage and StreetLight. Despite the limitations of crowdsourced O-D data (discussed later), such data generate many insights into travel choices not possible through the use of travel surveys and traditional data collection methods. Respondents gave the O-D data an average rating of 8.3 out of 10, indicating considerable enhancements to existing applications. The respondents also observed that their agencies have been mostly satisfied or very satisfied with proprietary O-D data, based on cost–benefit analysis. One respondent expressed a neutral attitude toward proprietary O-D data, commenting that the agency's sole use has been for travel-demand model development.

Because many agencies are in the early stages of using proprietary O-D data, research has focused on developing a better understanding of them. Venkatanarayana and Fontaine (2018) compared the quality of StreetLight O-D data to benchmark data collected through Bluetooth and automated license plate readers at four study sites. Various performance indicators—such as percentage different, percentage of missing data, and trends in factoring ratio—were used to assess the data quality. Because of concerns over the comparability of the benchmark data, the study's observations on the accuracy were not conclusive.

Ohio State University investigated whether proprietary O-D data can effectively replace or complement traditional cordon surveys (Miller et al. 2016). Researchers evaluated AirSage and StreetLight data with a benchmark O-D table for Allen County, Ohio. The overall goodness of fit using absolute error measures was relatively poor for external–external flows, while relative error measures suggested better fit, implying the patterns of external–external flows

from proprietary data and Ohio DOT data were similar. For external–internal and internal–external flows, both absolute and relative measures suggested a poor fit, implying that proprietary O-D data did not confirm the trip distribution pattern manifested in Ohio DOT data. The Ohio DOT data tended to locate a high percentage of traffic in the urban area, whereas proprietary data showed a high concentration of traffic along major highways.

One limitation of crowdsourced O-D data is the absence of traveler and trip characteristics. They also lack information on trip purpose, vehicle type, and vehicle occupancy. Relying entirely on these data is also problematic because navigational GPS data come from in-vehicle navigation systems, which are more likely to be installed in newer, more expensive vehicles. As a result, navigational GPS data are demographically biased toward travelers who drive these vehicles. Figure 10 illustrates this bias. It compares O-D data from the 2015 Ohio statewide model to 2016 LBS data and GPS data. The bias of GPS-based O-D information toward high income areas is evident. Additionally, these data are difficult to validate as there is no ground truth to verify the accuracy or representativeness of data.

Several other caveats were also noted. First, data must be processed carefully to remove biases and to be properly expanded before being applied to a travel-demand model. Second, depending on the data source, O-D data may be unable to differentiate route choice if parallel roads exist. One respondent also indicated that current data are not able to provide pedestrian and cyclist travel information.

In-vehicle GPS devices are the main source of probe data. Although these systems are precise, they are mostly installed in either newer or higher-end vehicles, skewing data on passenger trips because of the overrepresentation of high-income drivers. Likewise, larger commercial vehicle operations—compared to smaller local carriers—use more semi-trucks on which GPS devices are installed. Accordingly, interstates are overrepresented, and local roads are underrepresented. Furthermore, data are collected only from carriers that supply data to the data vendor (in this case, INRIX). Location-based services from GPS-enabled phones also carry limitations. They only transmit data when the phone's GPS function is enabled and in use. Although the resulting data are spatially precise, coverage is sometimes sparse, and it is not possible to distinguish cars from commercial vehicles. Nevertheless, there would be less demographic bias because of

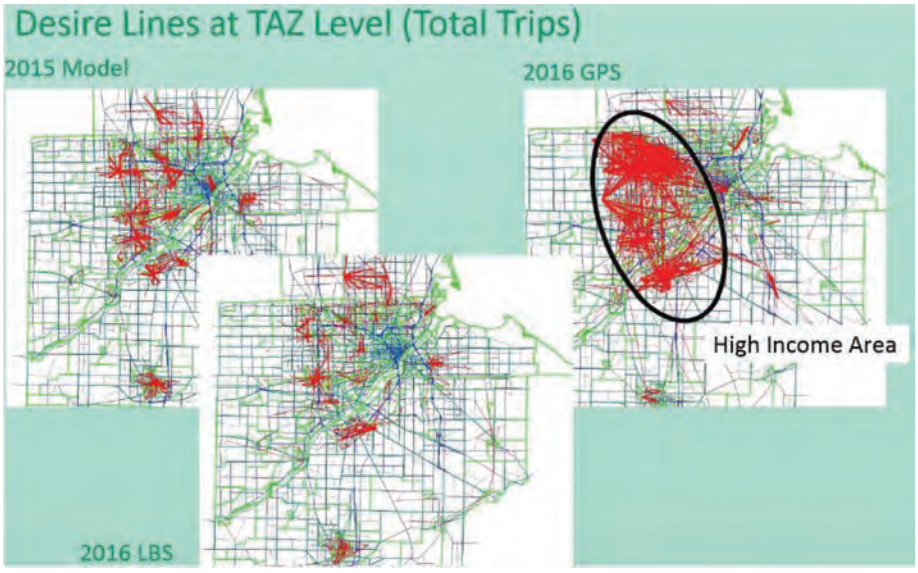

Figure 10. Ohio DOT study showing potential income bias (TAZ = travel analysis zone) (Giaimo 2017A).

widespread market penetration of smartphone devices, and it is possible to infer home and work locations because of long-term device persistence. A final challenge is trip-length bias. With no scientific or experimental design underpinning data collection, longer trips are potentially overrepresented in the data sets.

Freight and Truck Data

At least 12 agencies have purchased freight data from private vendors. Overall satisfaction was relatively high, with respondents commenting that the data enhanced their agency's applications. Freight data received an average rating of 7.6. Since truck data are generally hard to acquire, proprietary data offer a good alternative to in-house data collection. The data have been used to develop and validate freight-demand models, to develop freight plans, to conduct freight bottleneck studies, to determine the impact of roadway projects and closures on freight, and for other applications. Depending on the use restrictions negotiated with vendors, the data acquired by some states are restricted to certain applications, thus reducing the data's utility. For instance, Arkansas and Tennessee's DOTs cannot access raw data, receiving only post-processed data from their consultants.

As with O-D data crowdsourced from personal vehicle navigation systems, the data quality of freight- and truck-specific data acquired through GPS devices depends on the sample size and whether there is any bias toward certain carriers and source data providers. Analysis carried out by the Ohio DOT indicated that the trucks of interstate carriers tend to be overrepresented because they are more likely to be equipped with GPS devices. Trucks operated by smaller, more local firms—which use mostly non-freeway routes—are likely to be underrepresented. In addition, not all trucking firms carry devices that are part of the original source for such data products. Figure 11 compares truck trips in the Ohio statewide model to truck GPS data. This clearly shows the absence of UPS trucks in the data set.

Respondents noted other issues, including the sharing policy that restricts the extent to which data can be shared outside an agency. One respondent indicated that their agency cannot store data for future uses. Data quality is also a concern, with some agencies finding inconsistent results compared to the FAF and a few noticeable commodity errors that required alteration. Some agencies also expressed concern over the cost of proprietary freight data.

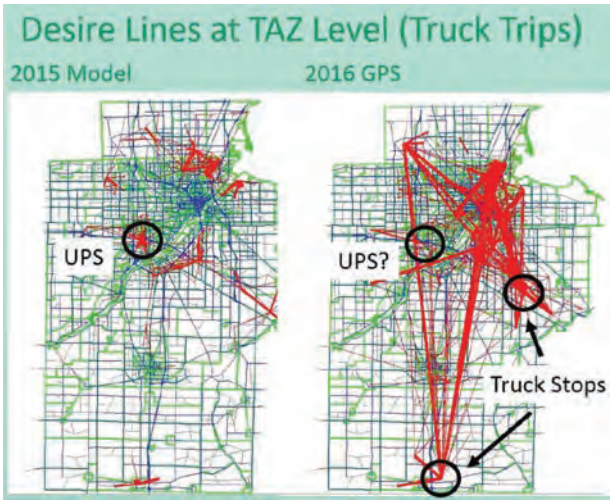

Figure 11. Ohio DOT study showing potential bias with trucks (Giaimo 2017A).

Crowdsourced Incident Data

A minimum of nine states have acquired and used crowdsourced incident data to complement real-time traveler information. The utility of incident data was rated as a 7.5, indicating that they offer a good enhancement to existing applications. Agency experiences with crowdsourced incident data have not been uniformly positive, however. One respondent said that their agency was dissatisfied with the data because it was very localized and concentrated in metro areas. Another respondent commented that the data are of limited use because of sparse coverage on arterials and inconsistency found with other validation data. Other agencies have been very satisfied with the data. The Iowa DOT integrated crowdsourced data into its TMC through email notifications and made it available internally for various GIS applications. The availability of such data has enabled the Iowa DOT to respond to incidents more quickly when there are no camera coverages. About 12% of their initial notifications in the TMC have been from Waze alerts. Pennsylvania has also integrated the Waze data into its traffic management center to help make decisions with regard to the dispatch of safety patrols.

Crowdsourced Non-Motorized Travel Data

While the availability of pedestrian and bicycle data has been limited historically, agencies need such data to make informed decisions about infrastructure investments. Crowdsourced data help agencies better understand the location of popular routes on the network, O-D, and trips durations, as well as factors that influence cyclists' decision making. At least four states reported acquiring cycling data from Strava, a technology company that—through its mobile application—allows users to track and upload their cycling, running, and swimming activities. The data have been used by agencies to develop safety risk factors for bicycles, document bicycle use on the system, identify optimal locations for bike counters, perform corridor studies, and assist in countywide planning and programming. Respondents rated the utility of these data as a 7 based on two responses, suggesting that the data offer enhancements to agency applications but may have some limitations.

One response indicated that in some cases, sample sizes may not be sufficiently large to draw valid conclusions. Bicycle count data are heavily skewed toward men and younger individuals and are typically more concentrated in cities and higher-income neighborhoods. Because the data are processed using GIS, this could pose a challenge for agencies with limited GIS resources. One respondent indicated that their agency is having difficulty finding applications for the data.

Other Data

Socioeconomic data At least nine agencies have purchased socioeconomic data from private vendors. Overall, they have been satisfied with the data, giving it an average rating of 8.1. Respondents said that the data have performed up to expectations in applications such as travel and econometric models. Socioeconomic data agreements carry fewer use restrictions compared to other data types, according to survey responses. Accordingly, agencies are using the data in multiple applications throughout their states. One agency has used the data to supplement population and employment data in rural areas and develop control totals for future land-use decisions. One caveat associated with socioeconomic data is that they are developed by third parties without significant oversight. Nor are vendors transparent about their data generation. This makes it challenging to validate data if questions arise.

Digital maps and aerial imagery At least six agencies have procured street maps and imagery data from private vendors. Respondents were inclined to endorse these data, giving

them an average utility rating of 8.1. Licensing or purchasing these data from a vendor eliminates the burden on agencies to collect and maintain data in-house. One potential drawback of these data is the additional effort or cost needed to convert imagery projections to achieve consistency with agency standards. Before purchasing or licensing imagery, an agency should also inspect the imagery quality to ensure it meets its needs. In addition, licensing agreements for digital maps may not allow agencies to integrate maps with their own inventory network and submit the integrated product to a federal program. Agencies should be aware of this restriction.

Peer Advice

The study team asked respondents—based on respondents' previous experiences acquiring and using proprietary data—to offer advice to peer agencies interested in procuring data from vendors. This section summarizes their responses, with recommendations split into four categories: Legislative and Institutional Support, Staffing, Procurement, and Data Uses.

Legislative and Institutional Support

- One respondent remarked that states would benefit if legislatures revisited and revised existing laws so that agencies could take better advantage of emerging data sources and more easily navigate issues with intellectual property rights. For example, before the adoption of H.B. 369 on May 10, 2016, the Utah DOT could not gather or use crowdsourced data that were collected based on personally identifiable information. Previously, the Florida DOT outsourced the procurement of third-party data to contractors because they would not be subject to the state's open records laws. However, new laws make Florida DOT subcontractors subject to open records laws. As a result, this practice is no longer used widely.
- Agencies will benefit from establishing procedures to facilitate proprietary data acquisition and their applications. The Oregon DOT plans to develop guidance on proprietary data contracting, data-sharing agreements, and assessments focused on whether the agency should conduct pilot projects with new firms based on the time and effort required.

Staffing

- Having staff with expertise in the types of data being acquired and their potential applications is invaluable. One respondent noted that staffing changes prevented their agency from rapidly executing a contract to acquire data.
- Agencies can benefit from having experts in data analytics on staff because such knowledge is critical for validating and processing data, which is particularly important during product and vendor selection.

Procurement

- One respondent urged agencies to thoroughly prepare for procurement by determining their data needs and identifying funding sources—including federal sources—to license or purchase data.
- It is important for agency procurement departments to circulate RFPs as widely as possible to reach a broad audience and to ensure a competitive bidding process.
- Two respondents commented on the importance of carefully attending to the terms and conditions laid out in contracts and user agreements. Contractual language is often complex and difficult to follow, which can foster misinterpretations by involved parties. To reduce the

likelihood of misinterpretations, agencies will benefit from involving their legal departments in the contracting process.
- Agencies should allocate sufficient time for solicitation, contract negotiations, and data integration, as delays can potentially occur during any stage of the procurement process.
- If city agencies and MPOs want to acquire data but lack the staff or resources to manage procurement, they will benefit from working with a state DOT. The state DOT could assume responsibility for issuing RFPs and contract negotiations, making sure to include the city agencies and MPOs in the final user agreement. This arrangement would relieve smaller entities of the logistical and managerial burdens inherent to procurement. But successful collaborations demand coordination and robust communication between all of the involved stakeholders.
- Before committing to a licensing or purchasing agreement, agencies should request sample data sets from vendors selected as finalists. These samples can be used for data suitability analysis and quality checks.
- If an agency decides to purchase an analytical tool, it should arrange for training to familiarize prospective users with its capabilities. One respondent said that while their agency's first RFP emphasized data at the expense of analytical tools, future RFPs would place a greater priority on those tools. Agencies should invest time to understand the proper balance of data and analytical tools necessary to meet their requirements before developing RFPs.

Data Uses

- Agencies should not underestimate the amount of time and resources they need to perform data integration. It is a very time-consuming task.
- Several respondents advised that agencies should ask vendors whether they can modify their products to reduce the amount of preparatory data cleaning that is required before data can be used by the agency.
- It is important to do as much outreach as possible with internal partners to build additional use cases.

Summary

This chapter summarized the findings of a survey that asked agencies to comment on their experiences licensing or purchasing proprietary data, the acquisition process, and data use. Forty-two state agencies and three MPOs took part in the survey. Most agencies have found a wide variety of uses and applications for proprietary data. Agencies use similar procedures for developing and issuing RFPs, evaluating proposals and vendor quality, validating data, and negotiating contracts. Overall, experiences with proprietary data have been positive and encouraging, although a small number of respondents said that their agencies were discouraged by either the data quality or by use agreements that were too restrictive. Reflections of agency respondents on their past procurements were summarized and presented as peer advice. The next chapter builds on the high-level summary data presented here by offering five detailed agency case examples.

CHAPTER 4

Case Examples

This chapter examines proprietary data acquisition in greater detail by looking at the policies and practices of four state DOTs and one MPO. The study team collected information by interviewing agency staff and reviewing agency procurement documents. Case examples are not inclusive of all proprietary data acquired by the agencies. The data and procurement cases presented in this chapter have been selected to reflect diverse practices that peer agencies may find useful.

Each case example discusses the following topics:

- Procurement method, including RFP and contracting;
- Use experience, including use cases and caveats, if any;
- Peer advice, including reflections of the agency interviewees on their experience with procurement, and advice to peer agencies planning similar acquisitions.

Because the narratives for each case example attempt to underscore the unique and interesting facets of each agency's practices, they review the listed items in the order above. But the amount of detail for each element varies.

Ohio DOT Experience

The Ohio DOT has acquired abundant third-party data in recent years. Since 2012, the agency has used third-party real-time speed data to monitor traffic conditions on major highways and to track maintenance response and recovery times when speed reductions result from incidents or weather events. In 2017, the Ohio DOT began licensing vehicle O-D data. This case example focuses on these two procurements.

Procurement Method

Speed data The most recent procurement of real-time and historical speed data was initiated in 2016. A copy of the RFP can be found in Appendix D2. The agency sought real-time speed data for all areas that had been covered by an expiring contract, as well as areas that had not been monitored previously. The RFP asked for historical speed data for at least 15,000 centerline miles, including all state, U.S., and Interstate routes. For real-time data, the RFP stipulated the minimum number of data points required and the minimum spacing between data points. The latter was based on average spacing of roadway segments. More specifically, the agency requested the following:

- Update and convey real-time data to the agency in 1-minute intervals between 5 a.m. and 9 p.m. and at a maximum interval of 3 minutes from 9 p.m. to 5 a.m.;

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- Guarantee data accuracy of ± 4 mph;
- Provide access to the analytics tools, including region explorer, massive raw data downloader, congestion scan, trend maps, performance charts, performance summaries, bottleneck rankings, and user delay cost analysis;
- Provide data in XML format and at an interval that would let Ohio DOT's traffic information systems produce accurate and timely traffic information; and
- Make real-time speed data available to the agency's central control system through a vendor's server.

The RFP stated that Ohio DOT intended to use real-time data for transportation purposes, including the operation of freeway management systems, the OHGO app and BuckeyeTraffic.org (both for color-coded speed range maps), and Ohio's 511 system. The agency required the right to distribute offline and archived speed data from Ohio DOT's database to other public agencies and universities. It also requested the use of historical data for any internal purpose without restriction and the ability to share them and any analytics tools with all public entities in the state of Ohio at no additional charge. Proposers were required to describe the methods and technologies they would use to capture real-time data, as well as their qualifications and experience. Proposals were evaluated in the following five areas:

- Organizational structure and project experience,
- Data service and support,
- Number of data points,
- Estimated costs, and
- Any exceptions the proposer submitted to the contract's supplemental terms and conditions or proof of concept phases associated with terms and conditions.

Origin–Destination data The Ohio DOT experienced firsthand the utility of detailed GPS track data when the agency used such data at a congested interchange to determine the possible causes of significant backups at an off-ramp. Patterns of vehicle turning movements uncovered in these data prompted the agency to adjust the timing and coordination of several signals on the arterial. As a result, this largely cleared up ramp backlogs, eliminating the need for a costly ramp reconstruction to add additional vehicle storage space. In 2017, Ohio DOT issued an RFP for O-D data services because the agency recognized the potential of such data to help identify low-cost solutions for problems that otherwise would be addressed using more costly methods.

The RFP requested access to accurate O-D data via online portal by Ohio DOT and any public agencies, such as local government, MPOs, universities, and transit agencies, as determined solely by Ohio DOT. There shall not be any use restrictions to an account holder from an Ohio public agency:

> While unlimited account access will not be given to private entities, Ohio DOT or an approved Ohio public agency account holder shall be able to provide the OD query results to a consultant(s) or a similar private entity working on their projects solely for use in that project. Approved account holders shall also be allowed to temporarily provide access to the OD data query tool to a private entity (such as a consultant) in order to perform queries solely for the purpose of working on that public agency's project. At the conclusion of the project work that requires the OD information, access to the OD data will be withdrawn from the private entity.

A complete copy of this RFP can be found in Appendix D3. The contract was awarded to the INRIX–StreetLight team for 1 year. Currently, the Ohio DOT is working toward a 1-year contract extension.

Use Cases

Speed data The main use cases for the real-time speed data are DMS, 511 services, and incident recovery monitoring. The historical speed data set has been used in a wide range of applications, such as before-and-after studies and calibration and validation of statewide and MPO travel-demand models.

Origin–Destination data The Ohio DOT and its agency partners have been exploring these data for various uses, including studying several corridors; assessing demand; analyzing weaving movements at complex interchanges and intersections; deriving the 30th highest hourly traffic volume; analyzing traffic patterns associated with high-congestion events; and evaluating travel route choice, trip-level travel-time reliability, and vehicle acceleration profiles (Giaimo 2017B, Parikh 2017, Granato 2017, Bernardin 2017, Coates 2017).

Ohio DOT staff have also applied the data in ways they had not anticipated when the agency originally licensed the data, such as evaluating the merits of proposed projects. The Transportation Review Advisory Council reviews capacity expansion projects requested by communities each year. In applications for expansion projects, heavy traffic or high truck volumes are frequently cited as key factors to justify the funding request. Previously, the agency had no reliable way to validate proposers' claims about traffic conditions. Having access to detailed trip data has equipped the Council with the information necessary to analyze and verify project justifications, which has improved its ability to judiciously allocate funds.

The O-D data cannot replace traditional household travel surveys because they do not contain information on trip or traveler characteristics. However, the data can supplement existing data on O-D pairs and turning movements. Analyses performed by Ohio DOT and partners also suggested caution when using and interpreting the data (Giaimo 2017A). In-vehicle GPS devices are the main source of probe data. Although these systems are precise, they are mostly installed in either newer or higher-end vehicles, skewing data on passenger trips because of the overrepresentation of high-income drivers. Likewise, larger commercial vehicle operations—compared to smaller local carriers—use more semi-trucks on which GPS devices are installed. Accordingly, interstates tend to be overrepresented, and local roads are underrepresented. Furthermore, data are collected only from carriers that supply data to the data vendor.

LBS from GPS-enabled phones also carry limitations. They only transmit data when the phone's GPS function is enabled and in use. Although the resulting data are spatially precise, coverage is sometimes sparse, and it is not possible to distinguish cars from commercial vehicles. Nevertheless, there would be less demographic bias because of widespread market penetration of smartphones, and it is possible to infer home and work locations because of long-term device persistence. A final challenge is trip-length bias. With no scientific or experimental design underpinning data collection, longer trips are potentially overrepresented in the data sets.

The Ohio DOT has had access to this O-D data for approximately 1 year. Because of the relatively short time period, it would be premature for the agency to perform a full cost–benefit analysis to estimate the return on the investment. Agency staff continue to explore new uses for the data. The data tend to overrepresent some users of the transportation system, which produces demographic bias based on factors such as age, income level, and vehicle type. Nevertheless, the data have proven useful for analyzing traffic on low-volume roads to measure crash rates for safety analysis. It would not be cost-effective to install the number of sensors necessary on low-volume roads to produce these estimates, which makes probe-vehicle data an attractive option. The Ohio DOT has not encountered issues over privacy concerns. The StreetLight platform, for example, warns users if they attempt to specify a geographic area that is too small or

too narrow of a time period. This feature potentially mitigates concerns about particular firms being targeted.

Peer Advice

Crowdsourced O-D data are relatively new to the transportation field. As a result, there is not a well-established market with well-defined products and competitors in the space. Limited competition in the field for such data can potentially drive up the price and make it difficult to evaluate the cost-effectiveness of acquisition. If an agency would like to acquire such data, it is critical for it to significantly involve its procurement department when developing RFPs. Asking procurement staff for input will help ensure that RFPs comply with internal purchasing guidelines and processes, while at the same time fostering competition among potential proposers.

Since this is a rather new data source without well-established use cases, it may take considerable time and effort for agency staff to cultivate a vision for how the data can be used. Once the decision is made to acquire the data, agencies may want to consider organizing workshops or seminars to provide training on the data and platform and bringing people from all work units together to identify potential use cases. Those collaborative activities will give agency staff an opportunity to think critically about the data and identify ways in which new data can be analyzed to solve problems. It is essential to raise awareness among staff about data availability and to hold trainings on the data and platform.

Wisconsin DOT Experience

The Wisconsin DOT administers and maintains Wisconsin's state highway system, which consists of 11,745 miles of roadways, including 876 miles of interstate freeways. Over the last 10 years, the agency has licensed data from several vendors, including Waze, TomTom, INRIX, and ATRI. These data have supported operations and planning applications, such as real-time incident awareness, speed and travel-time monitoring, and travel-model development. The following discussion highlights the agency's experience with data acquired from TomTom and ATRI.

Procurement Method

Real-time traffic data The Wisconsin DOT began licensing real-time probe-speed data in 2015. Procurement was motivated by the need to acquire reliable speed data as part of its ambitious I-39/90 Expansion Project, which is reconstructing a 45-mile interstate corridor that extends from the Illinois state line to the US 12/18 interchange near Madison. Anticipating that the project would take 6 years to complete, Wisconsin DOT needed to monitor traffic conditions on the construction sites, as well as the arterials in the area. The goal was to identify and publicize alternative routes for periods when congestion produces lengthy delays through the freeway corridor. Acquiring probe-vehicle speed data was deemed more economical than deploying permanent sensors for traffic monitoring, especially given that—while construction is temporary—instruments would incur long-term maintenance costs, in addition to the initial deployment cost. Since some arterials are not state roads, the DOT would have had to go through the process of signing a memorandum of understanding with local agencies and municipalities before deploying sensors on these roads.

The Wisconsin DOT's RFP solicited mean- and median-speed data for all roadways and routes expected to carry increased traffic during the I-39/90 Expansion Project. The RFP stated that

all data received from the selected vendor would be post-processed by the agency's STOC. Once processed, it would be used to alert the public of traffic conditions via DMSs and the agency's 511 website. The RFP specified that data were to be provided as XML-formatted content so they could be incorporated into the STOC ATMS. Data were to be received in 1-minute intervals, and vendor assistance with integrating real-time traffic data into Wisconsin DOT's current systems while enhancing or extending the agency's real-time traffic services was requested. The RFP also stipulated that Wisconsin DOT would retain the right to archive and use all data conveyed to it perpetually for analyses and research purposes.

Wisconsin DOT listed value-added features it wanted to see included in proposals (e.g., specific routes, potential for tiered pricing if centerline miles provided reached a certain threshold, and adjustable segment lengths). All proposals, the RFP stated, would be evaluated in three areas: proposer information and solutions, including organizational capabilities, staff qualifications, proposed solutions, licensing, and references; contract requirements; and the cost proposal.

TomTom was selected to provide travel-time data and services. The initial contract was for a 2-year fixed term with the option to renew for up to 5 years. The contract calls for providing data on approximately 200–300 miles of roads within Rock and Dane counties. However, it grants the possibility of future expansion to cover additional roads.

ATRI truck GPS data In 2014, Wisconsin DOT entered into an agreement with ATRI to make a one-time purchase of truck position data for the month of April 2014. The agency licensed data through its contractor, Cambridge Systematics, to facilitate the update of the statewide travel-demand model, and specifically for the preparation of an O-D truck table. Cambridge Systematics recommended contracting with ATRI for data, given its previous experience with working with other state DOTs on truck travel models.

The ATRI truck data contains GPS tracks of a truck (with unique ID) as it travels through the roadway. They were collected as part of the Freight Performance Measures Initiative (FPM), in collaboration with FHWA. The data provide a sample of truck movements across the state and can shed some light on the origins and destinations of these trips. The agreement restricts the use of these data, mandating that they are "only for the purpose of monitoring and assessing truck travel patterns and truck trip modeling within the state of Wisconsin." It also sanctions assessments of truck travel patterns to measure highway travel times. Wisconsin DOT agreed that it would not use the data to create carrier- or shipper-specific data, nor can the agency distribute data to other outside parties that have not signed the ATRI data-sharing agreement (unless compelled to do so by court order pursuant to Wisconsin public records law). However, the agency can present processed FPM data and analyses in aggregated, visualized formats.

Negotiations pertaining to the agreement centered on two issues: (1) How to handle open records disclosure and (2) How to handle trade secrets. Wisconsin DOT's Office of General Counsel (OGC) participated in the negotiation. Wisconsin public records law states that "except as provided by law, a requester has a right to inspect any record" kept by an authority. The OGC viewed the vendor's business and product information as records kept by the Wisconsin DOT, and any confidentiality agreement with the data vendor would not qualify as an exception "provided by law" that would justify withholding records in Wisconsin DOT's custody. Therefore, such an agreement would conflict with the state's open records law. However, OGC proposed a compromise solution—pursuant to Wisconsin Statutes § 19.36(5) and § 134.90(1)(c)—that would treat FPM data as a trade secret unless specifically designated otherwise by ATRI. Wisconsin Statute § 134.90(1)(c) defines a trade secret as information that derives independent value, actual or potential, from not being generally known to, and not being readily ascertainable by proper means by, other persons who can obtain economic value

from its disclosure or use. Under Wisconsin Statute § 19.36(5), Wisconsin DOT has standing to withhold records from public inspection if they are deemed trade secrets prior to judicial review.

The final agreement between Wisconsin DOT and ATRI holds that Wisconsin DOT recognizes ATRI's truck GPS data as a trade secret that can be withheld under Wisconsin Statute § 19.36(5), unless there is a finding by a Wisconsin court of competent jurisdiction. Wisconsin DOT is responsible for notifying ATRI if data are requested by an outside party. It is then incumbent upon ATRI to take legal or other action in a manner consistent with Wisconsin's public records law to argue against its disclosure before Wisconsin DOT would make it available. The agreement also states that Wisconsin DOT shall work with ATRI to develop and complete data-sharing agreements with any other parties (e.g., contractors doing work for the Wisconsin DOT) before ATRI data can be distributed.

Use Cases

Real-time traffic data As part of its effort to meet the requirement of Section 1201 of the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users for a real-time system management information program, Wisconsin DOT needed to provide information on significant, non-interstate routes in the southeastern part of the state and in the Milwaukee metro area. The agency expanded the contract with TomTom to cover speed and travel time on these roads.

The agency's ATMS software uses probe data to calculate travel times on predefined route segments. Such information is then posted to the DMSs and the travel-time list on the agency's 511 system at 511WI.gov. Route travel times are also archived by Wisconsin DOT for future use.

TomTom's data are attached to the OpenLR system, an open standard-location referencing system that uses a starting point, end point, and at least one intermediate point to delineate a road segment. Linking this system with Wisconsin DOT's linear referencing system was necessary to ensure accurate spatial attribution of traffic conditions. The initial integration of the network into ATMS software took several months. However, periodic network updates by the vendor would require the Wisconsin DOT to make manual adjustments to ensure a proper match of the links.

Probe-speed data have proven reliable based on validation using floating cars. Wisconsin DOT has renewed the license and expanded the data coverage to include roads in seven counties. The primary use of the data remains as inputs to ATMS to generate travel-time estimates on predefined routes to be displayed on DMS and on 511WI's travel-time list. The agency can also query archived travel speed for the entire state and use the results for other applications.

ATRI truck GPS data The ATRI truck data consist of GPS records within an approximately 7-mile buffer around the state. The purchase encompassed 1 month of truck data, which Cambridge Systematics used to develop O-D estimation data that, in turn, were used to categorize all O-D trips as short-distance closed tours (which refer to trips generally less than 100 miles that occur in a single day and have the same start and end points) and long-distance open tours, which can span hundreds of miles and whose starting and ending locations differ from each other.

Although the consultant processed all raw data, Wisconsin DOT engineers believe the final truck O-D table appears to be in line with those derived historically. The data have proven useful for understanding and modeling freight movements in Wisconsin. As such, Wisconsin DOT views the purchase as being cost-effective and conferring significant benefit to the state.

Peer Advice

Obtaining probe data to monitor traffic conditions is a much less-expensive option than installing sensors on roadways in areas under travel advisory during freeway construction. Agencies can modify their probe data coverage in the future if needs change; whereas, permanent sensor installations do not afford this flexibility.

Wisconsin DOT staff emphasized the importance of setting realistic expectations when initially establishing a contract with a new vendor. Once a vendor has been selected, agencies should anticipate devoting significant time to becoming familiar with the data and learning how to work with them. Before choosing a vendor, it is also critical for an agency to consider its potential customer service needs and to select a firm whose customer service performance is well documented and aligns with its requirements.

When procuring proprietary data, involving an OGC during contract negotiations is critical. This ensures that Wisconsin DOT's contracts with data vendors fully comply with state laws, and it offers reasonable protection to sensitive information.

Arizona DOT Experience

In 2017, the Arizona DOT initiated an effort to procure third-party data for various transportation applications. The adopted approach is innovative in that it enables the agency to award on-call contracts to multiple vendors. This master on-call agreement allows any public entity in the state (e.g., local agencies and MPOs) to enter into data licensing agreements with any of the selected vendors without going through a separate RFP process.

Procurement Method

Instead of seeking data from one vendor or vendor team, the Arizona DOT issued an RFP for multiple on-call contractors. The Systems Technology Development manager spearheaded this effort. He championed this approach because the Arizona DOT anticipated its data needs will evolve in the future, given the rapid changes in technology and, consequently, the data market. The agency believed this contracting strategy would offer significant flexibility because it does not tie the agency to a single vendor or service. With two or three on-call vendors, the agency could leverage the unique features of different products and services from different vendors to meet various needs.

The Arizona DOT requested statewide, regional, and local corridor-level traffic data for all purposes. Data were to cover the state freeway system, state and U.S. routes, arterials, and local routes. It solicited a wide range of data and services, such as:

- Historical traffic information,
- Traffic-volume counts,
- Travel time information,
- Traffic analytics,
- Predictive traffic,
- Traffic-pattern data,
- Performance measures,
- Mapping data,
- User interface that supports the visualization of real-time travel data,
- Archived data,
- O-D data, and
- Any future services or new features that vendors would like to propose.

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Planned uses of the data included providing traveler information to the public, obtaining and archiving historical traffic data to inform agency planning, tracking historical changes in traffic volumes, and using traffic data to report performance and support the operation of freeways and the arterial system.

In addition to describing the Arizona DOT's data needs, the RFP stipulated that the winning contractors shall be available to all jurisdictions within the state of Arizona that request traffic-data services and that utilize federal, state, city, county, or any other jurisdictional funding for such requests. With a statewide on-call contract, local agencies can directly request data and services through purchase orders. Representatives from Arizona DOT, Maricopa County DOT, and Maricopa Association of Governments participated in the RFP development and proposal evaluations. HERE and INRIX were selected as the on-call vendors. A complete copy of the RFP can be found in Appendix D4.

Arizona DOT officials highlighted the potential benefits of using statewide on-call contracting. Selecting two vendors opened access to an array of data products and services, each having different strengths. Including vendor base pricing in the master contract enhanced the transparency of the products and services offered, as well as pricing mechanisms. Agencies can use this knowledge to more accurately budget for project costs.

Use Cases

Since awarding the master contract, the Arizona DOT has ordered several products, including INRIX Roadway Analytics, INRIX Real-Time Traffic Flow, and StreetLight InSight (a cloud-based platform for transportation analytics). INRIX Roadway Analytics are used to identify bottlenecks, to calculate performance measures (e.g., delays, vehicle miles traveled, and vehicle hours of delay), and to perform safety evaluations. Speed and travel data at 1-minute increments obtained through INRIX Real-Time Traffic Flow have been used to improve dynamic monitoring of traffic conditions. StreetLight InSight data have been employed to generate O-D tables for commercial trucks and personal vehicles and to develop travel-demand models. Other public agencies are currently in the process of obtaining services from INRIX and HERE, based on their needs.

Peer Advice

Arizona DOT officials provided a number of suggestions that other agencies can consider when procuring third-party data. Before issuing an RFP, it is critical to identify big picture data needs and opportunities and to determine whether a joint effort for data acquisition is appropriate. It is useful to put together a working group with transportation professionals from state agencies, MPOs, cities, and counties to coordinate and discuss data needs. Pooling funds to license data would ultimately be a cost-effective strategy for obtaining data, but it can take a significant amount of time and effort to coordinate.

The RFP should specify that the contract will apply to all state agencies, universities, MPOs, cities, towns, and counties. This detail ensures that the procurement results in a contract that benefits all partners. It is also important to widely advertise the RFP for a significant period of time to reach as many potential vendors as possible. Ideally, a proposal review committee should include state DOT, MPO, city, county, and FHWA personnel.

The Arizona DOT's statewide on-call contracting is a novel approach to procuring third-party data. There were challenges and obstacles to work through because all parties involved in the process were not experienced in seeking multiple on-call contractors to provide the same service. The Arizona DOT benefited from clearly stating—during the early stages of procurement—that

both the agency and taxpayers would benefit from making data acquisition more efficient and giving multiple jurisdictions access to data. Strong partnerships between the Arizona DOT and MPOs and other local agencies have also facilitated adoption of the on-call contracting strategy.

Kentucky Transportation Cabinet Experience

Since 2012, KYTC has acquired historical speed data to support various transportation applications. The initial procurement was motivated by the need for reliable data to produce travel time-based highway performance measures. Other uses for the data have emerged since then, including travel-model validation, corridor studies, statewide network screening, and project selection. The historical speed data are referenced to a high-resolution street network provided by the vendor. KYTC was able to obtain data for roads outside the coverage of NPMRDS. In 2015, KYTC began licensing real-time speed data for reporting travel conditions and providing real-time incident information to the public.

Procurement Method

KYTC acquires historical probe-vehicle speed data through the KTC, a non-academic research center housed in the College of Engineering at the University of Kentucky. KTC is the designated research arm of KYTC under the Kentucky Cooperative Transportation Research Program. Acquiring data through a university partner allows KYTC to leverage technical capabilities at KTC, where researchers evaluate, process, and integrate the data to support various applications. KTC also creates statistics and reports that are shared with KYTC, MPOs, and other interested parties.

A data acquisition committee was formed during the initial efforts to procure data. It includes KTC researchers, KYTC engineers, and the University of Kentucky's purchasing officer. The committee has prepared RFPs, evaluated submitted proposals, and assisted with contract negotiations. Proposed data sets have been evaluated primarily based on roadway mileage covered, spatial resolution, and temporal adequacy. Sample data have been requested as part of the evaluation process.

All data acquired under the contract are licensed by KTC and the University of Kentucky and can be used to support all KYTC applications. Although raw data cannot be shared, KTC can distribute aggregated statistics, reports, and other derivative products to other agencies and the public.

Use Cases

Historical speed data Historical speed data are used for performance tracking of Kentucky highways over time. Congestion measures and travel-time reliability have been calculated for interstates, NHS roads, arterials, and collectors. Despite sparse coverage on some rural low-volume routes, the data have provided information on the operating conditions of roadways not covered by sensors. Researchers at KTC evaluated data quality and conflated vendor-supplied street networks with Kentucky's Highway Information System network to join the attributes from the two data sets. Network conflation requires significant effort. Regular maintenance will be needed in the future as vendor and KYTC networks undergo periodic updates.

Recently, KYTC introduced the Strategic Highway Investment Formula for Tomorrow model. Its aim is to quantitatively assess and compare the benefits of proposed projects. One of the seven measures in the funding formula is congestion. Measures based on probe-speed data

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reflect traffic congestion better than traditional measures such as volume-to-service flow ratio. Analysis of probe-speed data by the KTC–KYTC team is being used to develop comprehensive sets of congestion measures for statewide network screening and project selection. Data are also used for MPO congestion management programs, travel-model calibration and validation, bottleneck identification, and air quality analysis.

Caution is needed when interpreting data, especially for roads with limited data coverage. For example, low speeds on some rural roads in the mountainous area may not denote congestion. They may be the product of heavy trucks traveling on steep grades, which are abundant in the eastern and southeastern portions of Kentucky (this condition is an issue for real-time data, as well). Thus, one must be mindful of the context in which speed data are collected before drawing conclusions.

Historical speed data have enabled new forms of analyses. However, processing such a large volume of data initially strained KYTC's computing infrastructure. A system upgrade to a Hadoop cluster greatly enhanced the agency's capability in handling big data projects, such as processing, analyzing, and disseminating data in real time.

Waze and real-time speed data Prior to acquiring real-time speed data, the traffic management center in Louisville, Kentucky—called Traffic Response and Incident Management Assisting the River Cities (TRIMARC)—relied primarily on fixed-location sensors, such as radar and microwave, to monitor operating speeds on major highways. Real-time probe-speed data are used at the TRIMARC operations center mainly for posting travel times to DMS throughout Louisville and northern Kentucky. Limited floating car runs were used to validate data, and the results were satisfactory.

Probe-speed data provide better coverage on roads outside the Louisville metropolitan area, where sensors are less prevalent. Furthermore, under the agreement KYTC can use the data for internal purposes, save and archive data for future uses, and package data for reporting. The agency can also share data with its contractors.

KYTC also established a partnership with Waze through the Connected Citizens Program. Under the Connected Citizens Program agreement KYTC signed with Waze, KYTC shares information with Waze about planned road closures and construction events. In return, KYTC can access information from Waze users about road conditions, such as accidents, potholes, traffic jams, and other hazards.

At the statewide level, Waze data and real-time speed data mainly support KYTC operations in the areas of incident detection and management, traffic monitoring and management, tracking vehicle speeds during winter weather events to gauge the effectiveness of snow and ice removal activities, and deciding on the warnings or instructions to place on DMSs. Having access to these data, KYTC reinvented its 511 traveler information system. Before acquiring real-time speed and crowdsourced data, the state's 511 system relied on telephone-based operations. With its advanced IT infrastructure, KYTC now combines various data sources to generate a comprehensive picture of real-time conditions throughout the state's roadway network. Key data sources include the following:

- HERE real-time speed data,
- Waze incident and jam reports,
- Waze traffic viewer,
- Twitter,
- Doppler radar,
- KYTC's traffic operations center,
- TRIMARC incident reports,
- snow plows,

- internal crowdsourced activities throughout the state, and
- DMS.

KYTC aggregates data from these sources and harmonizes them based on location and time. KYTC staff can select any district, county, route, or mile-point range and observe all available real-time data at the KYTC's disposal for that location and the chosen timeframe. Information on alerts and delays from the real-time data are now used to populate GoKy.ky.gov—the state's real-time traffic information map—with the most up-to-date traffic conditions. Figure 12 shows the map and data view for downtown Louisville. Users can toggle operational layers on and off, examine traffic flow patterns, identify the location of DMSs, and view weather updates from the National Weather Service. In 2016, KYTC phased out its telephone-based 511 system and shifted all data management to in-house staff, saving the agency $750,000 per year.

Real-time speed data—coupled with immense computing power—have greatly enhanced KYTC's operations. KYTC staff use these data to generate novel insights about traffic events that would otherwise be expensive to obtain. For example, Figure 13 shows variations in vehicle speeds resulting from a major crash. These data provide a holistic view of the crash and facilitate the after-action review for the incident management program.

Aggregating, processing, and publishing data in real time helps KYTC quickly re-create events surrounding a particular incident—or an entire day—and determine the factors that

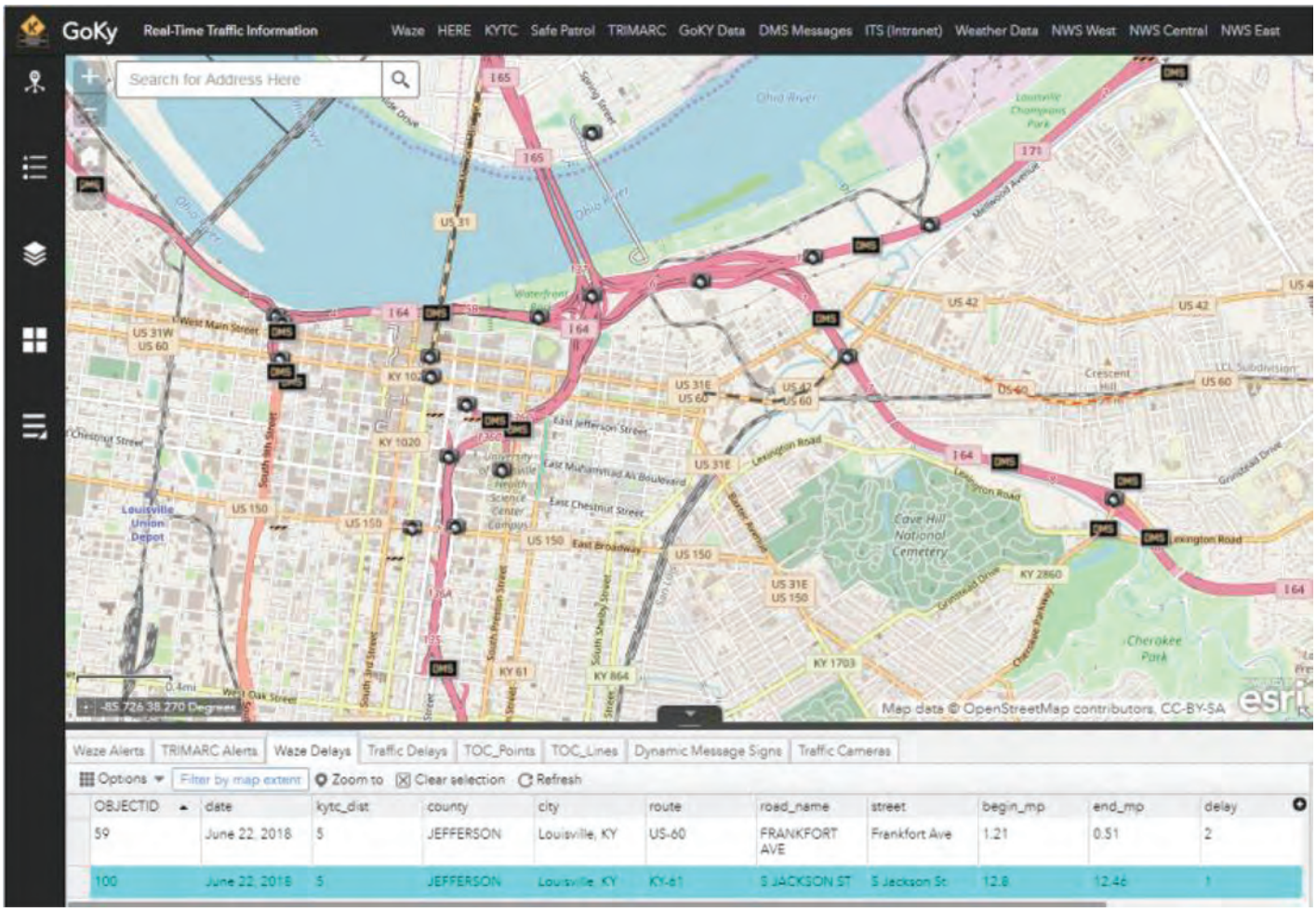

Figure 12. Screenshot of GoKy.ky.gov website.

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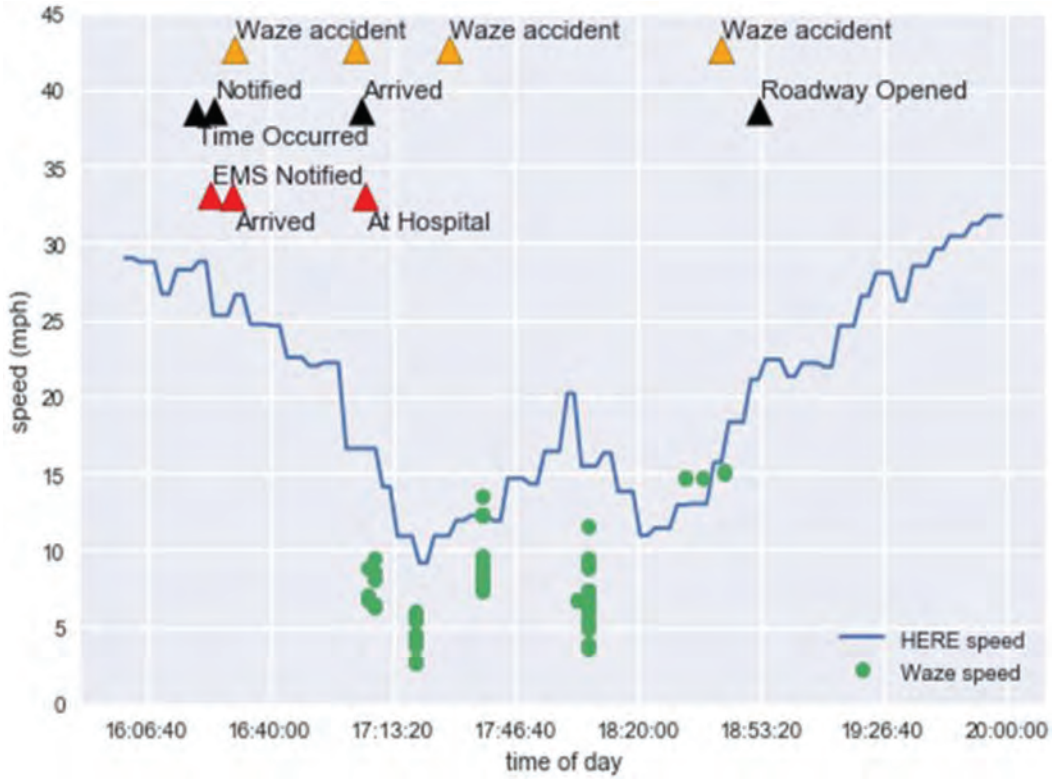

Figure 13. Crash timeline and impact on speed.

contributed to its occurrence. This information facilitates after-action reviews and strengthens KYTC's incident management program, helping the agency improve its responses to future incidents. Large data sets, which integrate the perspectives of multiple roadway users, also foster a more complete representation of incidents in real time.

Peer Advice

Agencies should have a clear vision on how data will be utilized when preparing RFPs and evaluating data products. KYTC is interested in a reliable data source with a finer spatial granularity than the TMC segmentation. Speed data referenced to street network links have proven useful for a number of applications. Such data tend to be very large in size and will require extensive effort to integrate with the linear referencing system used by the agency. Nevertheless, a partnership with KTC has enabled KYTC to leverage technical expertise beyond agency staff resources for procuring, processing, integrating, and analyzing these data.

Processing and displaying real-time data can be challenging. Lags in real-time data may be propagated by the processing time required. Complications, such as multiple reports of the same incident, often require additional verification before the data can be used for analytical purposes. Despite these obstacles, KYTC has been satisfied with the quality of the real-time data it has received, as well as the willingness of data providers to continually work with the agency staff to streamline the data delivery.

Utilizing open-source parallel computing architecture and off-the-shelf tools has helped KYTC process and integrate various data feeds for traffic and incident monitoring in real time. However, it may be challenging to integrate this advanced architecture with the conventional information technology systems.

Atlanta Regional Commission Experience

The Atlanta Regional Commission (ARC) is a federally designated MPO that collaborates with state and local transportation agencies and governments to produce and manage the Regional Transportation Plan. Several groups within ARC's Center for Livable Communities are dedicated wholly or in part to transportation planning and analysis, including Transportation Access and Mobility, Mobility Services, and Research and Analytics.

The Research and Analytics group supports the other groups by collecting data on issues such as demographics, land use, health, transportation, and crime. They perform economic and land-use modeling and geospatial analysis and generate statistics to inform various transportation analysis and planning activities carried out by other ARC groups. The Mobility Services group develops the Transportation Demand Management Plan. This plan focuses on incorporating demand management strategies into planning, project development, and decision making related to system operations investments. The Transportation Access and Mobility group works on issues related to the regional transportation plan, the transportation improvement program, transportation modeling, performance analysis and monitoring, transit planning, and outreach. With groups being responsible for different areas, they have both distinct and overlapping data needs.

Procurement Method

Data have typically been obtained to meet specific project needs at ARC. The planners and technical staff at ARC take active roles in identifying their data needs and researching the market and the data sets for their applications. They enlisted help from a consultant the first time they acquired probe-vehicle speed data. Subsequent acquisitions have gone through a sole-source acquisition process.

According to ARC rules, sole-source acquisition requires proper justification. In the cases of these data licensing contracts, the oft-cited justification is that goods and services are only available through one source. ARC staff conducted significant research on the data and the market, and they prepared documentation on why it is in the best interest of ARC to directly work with a particular provider without the formal RFP process.

Use Cases

Historical speed data ARC began licensing probe-speed data in 2012 to develop mobility performance measures and to validate travel-demand models. Before licensing the data, ARC retained a consultant to evaluate available data and marketplace conditions. Based on the evaluation, ARC licensed with a vendor to provide probe-vehicle speed data. Since then, ARC has switched to another provider, citing more expansive data coverage and access to user-friendly tools.

Integrating the data with the existing data system was a necessary but also very challenging task. There are several versions of the network maintained at ARC and Georgia DOT. ARC's modeling group maintains a network model in Cube, while the Georgia DOT maintains a linear referencing system for the statewide highway network. The task of linking the vendor's network—which the probe-speed data references—and Georgia DOT's linear referencing system network was extremely time-consuming. Although the NPMRDS provides good information on major roadways, ARC still needs data for roads outside the NPMRDS network.

Origin–Destination data Recently, the Mobility Services Division licensed O-D data from StreetLight. These data are intended to illustrate trip patterns in more than 900 census tracts

around the Atlanta metropolitan area and the seven Transportation Management Association territories. Staff in the Mobility Services Division developed the data specification and worked with the budget office to complete the acquisition.

ARC licensed monthly O-D data based on the agency-specified O-D zone structure. The query does not directly provide trip volume because the GPS devices that are part of the data source do not represent a 100% market penetration. Additional processing using traffic-count data is needed to derive O-D volumes. There is some concern over potential bias toward locations where cell phone activity is dense. However, the agency has been very satisfied with the information provided by the data and the ease of integrating results into the GIS platform.

Most recently, the Center for Livable Communities began licensing O-D data from AirSage, a firm that collects and analyzes mobile phone signals; GPS; and other locational data to understand traffic movements. ARC intends to use the data to better understand external travel patterns for the region. With a 25% surcharge, the data licensing agreement allows ARC to treat these data as open data and to distribute them freely without restriction.

Peer Advice

Technological advancements have been continually generating new data and products. ARC recognizes that its data needs are evolving and that the landscape of the data market is also evolving, with new products entering the market from time to time. It is challenging to budget for the data acquisition cost in advance.

If an agency contains multiple divisions that have a blend of unique and overlapping data needs, internal stakeholders should talk through their data requirements and determine whether it is possible to improve coordination to garner the best possible returns. It would usually be more economical to acquire a data set that can be used by multiple groups rather than a cheaper but more restrictive data set that can only be used for one purpose. On a similar note, ARC staff cited the importance of building strong collaborative relationships with local partners, such as state DOTs, local transit agencies, and local governments. Coordinating with such entities potentially fosters partnerships for sharing the cost of licensing data under regional sharing agreements. ARC recently negotiated a regional license for REMIX, a software tool for transit planning that will give access to ARC, the Metropolitan Atlanta Rapid Transit Authority, and several local transit agencies. Each agency would pay less under the regional license compared to the individual licenses they previously held.

On a broader scale, ARC staff emphasized the importance of establishing a clear vision for how data are going to be used. Identifying questions or problems that are to be addressed before licensing data will help agencies choose the most appropriate data sets for their needs.

ARC recognizes that it is challenging but important for agencies to keep up with the latest advances in technology, market conditions, and data availability. It is important to engage in continual dialogue with potential data providers with regard to agencies' data needs and formatting requirements. Communicating data needs to multiple providers fosters healthy competition when agencies solicit proposals for data, potentially lowering the cost and increasing the value-added benefits vendors are willing to offer.

CHAPTER 5

Conclusions

Recent technological advancements have led to new types of transportation data. These data often have greater temporal and wider geographical coverage and may contain more details than the traditional data sets (e.g., probe and crowdsourced data). Despite facing challenges associated with obtaining these new proprietary data, state DOTs and MPOs have been using them to meet various needs. This study compiled information on the practices and experience of state DOTs and MPOs on the acquisition and use of proprietary data for transportation applications.

Summary of Findings

Data and Uses

Survey results indicated that DOTs and MPOs have acquired several types of data, such as real-time and historical speed data; O-D data, including truck trip data; bicycle- and pedestrian-count data; crowdsourced incident and jam alerts; socioeconomic data; freight movement data; and digital map and imagery products. These data are used to support a wide range of agency business areas.

Among the data reviewed, real-time and historical speed data are the most widely used by transportation agencies around the U.S. for a variety of applications. Agencies employ real-time speed data to support highway operations, including travel-time monitoring, posting alerts on DMSs, 511 services, and incident recovery monitoring. With respect to traffic monitoring, the use of probe-speed data varies among agencies (Athey Creek Consultants 2017). Some agencies obtain such data only for roads that lack sensors or for specific project needs, while others are shifting to probe-speed data for statewide coverage and only deploy sensors where probe data are inadequate. Historical speed data are often used in applications such as performance measures, corridor studies, before-and-after project evaluations, and travel-demand model validation.

Highly precise GPS data from in-vehicle systems and mobile phones have found numerous uses in transportation applications. Vendors are processing these data to provide information on O-D pairs—including for trucks—at various spatial and temporal resolutions. These data provide useful information on trip patterns that are not available from traditional data collection methods. However, concerns remain about the potential biases inherent to these data because samples are not randomly selected and can be demographically skewed. These data often require additional staff resources for validation purposes.

A growing number of agencies are partnering with Waze under its Connected Citizens Program. These partnerships give agencies access to incident and jam alerts generated by Waze users, which can then be incorporated into the agencies' traffic monitoring and reporting

services. In exchange, agencies send Waze information on special events and planned road work, which are shared with Waze users. Crowdsourced alerts are likely to become an increasingly important part of providing incident awareness.

Crowdsourced smartphone applications also benefit from data collection for non-motorized modes of travel, such as for bicycle and pedestrian trips. Several agencies have begun to leverage these emerging data sources to better understand popular routes on networks and factors that affect cyclists' decision making. The analyses help agencies to identify optimal locations for bike counters and to make informed decisions about infrastructure investment. However, issues found in other data types—such as limited sample sizes, as well as demographic and geographic biases—are also present in the non-motorized data.

Many agencies have also procured socioeconomic data, employment data, freight movement data, as well as digital maps and aerial imagery to support transportation applications. These data tend to be licensed from well-established providers.

Agency Concerns and Practices

Survey respondents and interviewees identified several barriers to and concerns associated with procuring and using proprietary data. They offered reflections on their experiences procuring data and shared their perspectives and recommended best practices. Table 8 summarizes these concerns and related agency experiences and practices.

Successful Procurement Practices

The agency experiences and practices listed in Table 8 address general concerns with regard to proprietary data, while the practices discussed in this section pertain specifically to the procurement process. Some practices overlap, but they are discussed in more detail here. Successful practices are summarized in the following categories across different stages in the procurement process.

Legislative and Institutional Support

- Agencies can take better advantage of emerging data sources and more easily navigate intellectual property rights if legislatures revisit and amend existing laws that may restrict or prohibit acquiring or using crowdsourced data collected based on personally identifiable information.
- Establish procedures explicitly for proprietary data acquisitions and applications, which should cover data contracting, sharing agreements, and quality-assessment strategies, as well as market evaluation.
- Incorporate proprietary data into DBPs as an integral component to fulfill departmental business needs and to fill data gaps. Promote coordination and collaboration among departments within agencies and other state DOTs to make the best use of agency resources and to reduce the cost of proprietary data acquisition, storage, and sharing.
- Identify funding sources for data acquisition. If possible, establish a regular budget to maintain data purchases or subscriptions, given that the data meets the agency's business needs.
- Ensure that agency staff have necessary expertise or skills to acquire and work with proprietary data. This may include training, IT, and legal support.

Before Issuing the RFP

- Establish a workgroup consisting of staff from different offices and divisions within an agency to identify data needs. Determining to what extent data needs overlap should be a key focus of conversations. Forming workgroups is also useful for making different work units

Table 8. Identified agency concerns and practices.

Barriers and Concerns	Agency Experiences and Practices
Data and Service Quality	• Include clear data specification in the RFP, including temporal and spatial coverage and sample size requirement. • Request sample data from vendors for evaluation. • Take customer service into consideration during vendor selection. • Include service-level agreement in the RFP and contract; perform regular data-quality audits. • Specify an exit strategy in the contract.
Cost	• Request clear cost structure from vendors, including future renewal pricing options. • Use a standard cost sheet to facilitate comparisons among vendors and products. • Coordinate with internal units and collaborate with partnering agencies on data licenses to achieve economies of scale; explore pooled-fund options for data procurement.
Staff Expertise and IT Resources	• Involve agency IT and data analysts in procurement process. • Consider open-source, off-the-shelf tools for data processing needs.
Finding the Right Product	• Use an RFI to gather information on the current market. • Promote intra- and interagency collaboration to coordinate data needs. • Develop a clear vision for data uses. • Specify broad agency data needs and ask vendors to propose services to meet those needs. • Consider analytical tools in addition to data.
Legal Issues (use restriction, non-disclosure, and privacy)	• Involve agency legal counsel in contract negotiations. • Specify terms of use in the contract, and try to include all agency internal business areas while balancing costs. • Specify data-sharing plan in the contract. • Specify how to handle open records requests in the contract.

aware of new data potentially becoming available, which can prompt brainstorming about potential uses.

- Circulate an RFI—if possible—to gather information with regard to the data market, including data availability, vendor experiences with other agencies, and pricing and licensing arrangements. For example, the I-95 Corridor Coalition leveraged this approach, issuing two RFIs before it formally initiated procurement. The first RFI described the Coalition's vision and objectives to solicit feedback from prospective vendors. A second RFI was prepared

based on vendor input and sought additional comments from vendors. Circulating two RFIs aided the Coalition's efforts to develop a targeted and refined RFP.
- Make sure in-house data analysts, IT, and legal experts have a role in acquiring data. They provide valuable input on data integration, processing, storage, and management as well as critical legal support to protect the agency's interest.
- Improve collaboration with partner agencies, and explore the viability of pooled-fund acquisition. This may also reduce the cost for each agency because of economies of scale. A number of respondents and interviewees consider this approach beneficial. Two agencies indicated that they have adopted this approach when acquiring certain data items.

What to Include in the RFP

- Provide clear data specifications, including required data feed format and temporal and spatial resolution. Agencies will benefit from asking prospective vendors to supply data in a format that minimizes the effort they need to expend integrating data with existing software systems.
- Use standard cost sheets to simplify price comparisons among vendors. For instance, Missouri DOT not only required vendors to structure their cost proposals by start-up cost and recurring subscription for several predefined data sets, but they also asked vendors to propose per centerline mile cost in case the Missouri DOT decided to only purchase portions of a data set with the budget available to them.
- Ask proposers to provide pricing information for different licensing options, such as license for agency internal use only and license for all public agencies statewide.
- Use the service-level agreement to ensure data quality. State in the RFP and contract that payment is contingent upon data quality (e.g., availability, accuracy, and latency). I-95 Corridor Coalition, Missouri DOT, and Ohio DOT have such provisions in their contracts. However, this requires agencies to devote resources to routinely audit data.
- State data terms of use explicitly (e.g., specify if data will be used for a single or a specific set of applications, for the agency's internal use only, or for all public agencies in the state).
- Specify data-sharing needs. Agencies must be specific about their plans for sharing the data, aggregated data and statistics, reports, visualization, and other derivative works.
- Ask vendors to discuss the integration efforts based on the agency's need. Request vendors' past work on integration with other public entities.
- Outline specific terms of technical service, including customer service response time.

Product and Vendor Evaluation

- Follow agency guidelines or state regulations, if any, with regard to proposal evaluations. Over two-thirds of the surveyed states have formal guidelines for evaluating vendors and their products. For example, at Minnesota DOT, a panel must be convened to develop RFPs if the total contract value will be $50,000 or more. The agency's policies enumerate several important factors that should be considered when selecting contractors, including costs, experience and background of both the vendor and its personnel, past work examples, level of understanding with regard to the contract and its specifications, and overall strategy or methodology.
- Develop a list of follow-up questions for vendors with regard to their original data sources and methodologies used for processing data. These questions foster transparency and help the agency better understand the strength and weakness of a vendor's data and approach.
- Request sample data, an on-site demonstration, or both.

Agreement Negotiation

- Specify terms for renewing contracts, and negotiate a renewal cost structure up front. This cost structure may be in the form of total annual cost or maximum rate of increase

per year. This step offers clarity on expected future costs, allowing agencies to prepare more accurate budgets.
- Work with in-house legal counsel during contract negotiations. The goal is for agencies to ensure full compliance with federal, state, and local laws, especially as it relates to how open records requests for proprietary data will be handled.
- Negotiate agreements with private vendors to obtain the most favorable terms possible.
- Specify and confirm data-sharing policies.
- Articulate an exit strategy clearly within contracts.

Areas of Future Research

Agencies are likely to face similar challenges during data acquisition, validation, and application. Survey results show that agencies purchased the same or similar data sets for the same intended uses. Agencies that are new to proprietary data acquisition can learn from early adopters. Hence, communication with peer agencies often proves valuable. Peer exchanges can be an effective approach for interagency information sharing. Efforts at the national level may be needed to develop guidance or standardized processes for proprietary data acquisition, validation, and integration.

Areas of future research are identified as follows:

- Develop standard proprietary data license models and application guidelines for those commonly used data types.
- Investigate unit cost of proprietary data based on past procurement to assist agencies in future decisions on acquiring data.
- Develop guidelines and methodologies to help state DOTs and MPOs: (1) validate proprietary data; and (2) integrate the proprietary data with their own network, such as state DOTs' linear referencing network and MPOs' travel-demand model network.
- Conduct more analyses on bike and pedestrian data.
- Conduct case studies or peer exchange to identify successful practices on proprietary data uses, management, and governance.
- Conduct case studies or peer exchanges to evaluate the benefit, challenges, and best practice of forming partnerships among agencies, including state DOTs, MPOs, transit agencies, and local government to pool resources and share data.

Today, innovation in the technology sector is transforming the field of transportation. As connected and autonomous vehicles and mobility-on-demand services continue to expand their user bases, the data needs of transportation agencies will continue to evolve. In the meantime, new challenges will certainly surface during the process. Prompted by these proprietary data in large volume, many agencies have begun turning toward big data tools or cloud computing services to handle their data processing needs. As noted in *NCHRP Synthesis 508: Data Management and Governance Practices* (Gharaibeh et al. 2017), this transformation may create additional uncertainties, such as data security risks.

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Glossary and Terminology

ARC	Atlanta Regional Commission
ATIS	advanced traveler information system
ATMS	advanced traffic management system
ATRI	American Transportation Research Institute
CSV	comma-separated values
DBP	data business plan
DMS	dynamic message sign
DOT	Department of Transportation
FAF	Freight Analysis Framework
FPM	Freight Performance Measures Initiative
GIS	geographic information system
GPS	global positioning system
HOV	high-occupancy vehicle
HPMS	Highway Performance Monitoring System
iPeMS	Iteris Performance Management System
IT	information technology
KTC	Kentucky Transportation Center
KYTC	Kentucky Transportation Cabinet
LBS	location-based services
MAP-21	Moving Ahead for Progress in the 21st Century
MPO	metropolitan planning organization
MVDS	microwave vehicle-detection system
NHS	National Highway System
NPMRDS	National Performance Management Research Data Set
O-D	origin–destination
OGC	Office of General Counsel
PATH	California Partners for Advanced Transportation Technology
PTI	planning-time index
RFI	request for information
RFP	request for proposal
RITIS	Regional Integrated Transportation Information System
STOC	Statewide Traffic Operations Center
TAZ	travel analysis zone
TMC	Traffic Message Channel
TRIMARC	Traffic Response and Incident Management Assisting the River Cities
vph	vehicles per hour
VPP	Vehicle Probe Project
XML	Extensible Markup Language

APPENDIX A

Survey Questionnaire

Dear Colleague:

You are invited to participate in a research study conducted by the University of Kentucky on behalf of the National Cooperative Highway Research Program. The purpose of this survey is to gather information on the acquisition and use of proprietary data at state Departments of Transportation (DOTs) in the interest of sharing best practices among transportation agencies. The questions are grouped into two sections: (1) data and use experience; and (2) acquisition process. For an agency that has acquired multiple data sets, input from more than one person may be needed. In such case, we would like to request that you act as the point person to coordinate the responses and shepherd the survey through the agency. Your cooperation in completing the questionnaire will ensure the success of this effort. Please follow the below directions for completing the survey.

Please complete and submit this survey by Thursday, 3/22/2018.
Please submit only ONE survey per agency/State DOT.
A PDF version of the survey can be downloaded here.

Starting the Survey: If you receive the original survey link on behalf of your agency, please start the survey by filling out your contact information. To save the progress at any point, click the "Save and Continue Survey Later" link at the upper right corner of the window and enter your email address. A unique link to the saved survey will be sent to you automatically from Survey Gizmo that allows you to continue from where you left off.

Collaborate with Others: After you have completed your part, you can forward the saved survey link sent by Survey Gizmo to the next person. Make sure that only one person works on the survey at a time. If you receive the saved survey link from others, please use the "Back" button at the bottom to navigate to Page 2 of the survey and provide your contact information. Use comma to separate from the existing entry.

Submitting the survey: Although multiple people can contribute to the survey, it is important that only **ONE** person from the agency clicks the "Submit" button at the end. Once the "Submit" button is clicked, the survey will be sent to the researchers, and you will no longer be able to edit responses.

Privacy: Although the survey asks for your name and contact information, this information will only be used by the research team if follow-up or clarification is needed on your responses. Survey results and the research publication will only identify the agency name as the respondent, not the individual.

If you have any questions about the study or the survey, you may contact:

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Phone: 859-257-9262
Email: mei.chen@uky.edu
Your time and effort are greatly appreciated in support of this important and timely research effort.

Please provide us with basic contact information. If more than one person from your DOT is contributing responses to the survey, please use a comma to separate each individual's name, title, and other contact information.

Name: _____

Title: _____

Agency: _____

Email address: _____

Phone number: _____

Data and Use Experience

1. Has your agency acquired any proprietary data? (NPMRDS should not be included)

   ☐ Yes. Could you share a copy of the RFP and/or licensing agreement/executed contract? (file upload or email)

   ☐ No. What are the main obstacles? _____

2. What proprietary data product(s) has your agency acquired? Explain how your agency has used, is using, or intends to use, each data product. Put a star (*) to indicate the use is not anticipated at the time of the acquisition. We would also like you to rate the value of the proprietary data using a 10-point scale, where:
   1 – The data offers little improvement to its intended applications.
   10 – The data provides significant enhancement to all its intended applications, replaces some existing data items, or even finds additional uses.

70 Practices on Acquiring Proprietary Data for Transportation Applications

Two illustrative examples are provided below:

Description of proprietary data product acquired	Data Delivery Format	What are the uses? Mark unanticipated use with an asterisk (*).	How would you rate the value of the data? (1-10)	Explain the rating
HERE link-referenced speed for cars and trucks on all roads for year 2015.	*CSV file download portal; base map shapefile*	*Generate annual performance measures; Support corridor planning study; *Identify previously unknown truck presence on some roads*	*8*	*The system-wide coverage enables us to evaluate the performance of many lower functional class roads, where traditional data are extremely limited. We are concerned with sparse probe vehicle coverage on low volume roads though.*
Waze traffic accident and jam alerts since 2013	*Real time feed*	*Provide real time traffic feed to 511; Support traffic incident management*	*7*	*The data provide useful information to the current traveler information system and supplement the existing data*

3. Does your agency need to integrate the proprietary data with existing data system(s)? If yes, please elaborate. Who handles the data integration (agency, contractor, vendor)? What is your agency's experience with the integration process, including any technical difficulties encountered?

Data Item	Integration needed? Elaborate, if yes.	If yes, who handle(s) the integration?				Elaborate on your experience, including any technical difficulties encountered
		Agency staff	Consultant	University	Vendor	
		☐	☐	☐	☐	
		☐	☐	☐	☐	
		☐	☐	☐	☐	
		☐	☐	☐	☐	
		☐	☐	☐	☐	
		☐	☐	☐	☐	
		☐	☐	☐	☐	

4. Are there any caveats concerning the proprietary data that may hinder its uses? What advice would you give on future acquisitions regarding data specifications?

Data Item	Caveats	Word of advice on future acquisition

5. Considering the associated benefits (e.g., enhanced support to applications, new insight) and costs (e.g., acquisition cost, IT infrastructure, legal and technical challenges), how would you rate your overall level of satisfaction with the proprietary data?

Data Item	Very dissatisfied	Dissatisfied	Neutral	Satisfied	Very satisfied
	☐	☐	☐	☐	☐
	☐	☐	☐	☐	☐
	☐	☐	☐	☐	☐
	☐	☐	☐	☐	☐
	☐	☐	☐	☐	☐
	☐	☐	☐	☐	☐
	☐	☐	☐	☐	☐

Acquisition Process

6. What are the main driving factors behind the decision to acquire the proprietary data?

Motivations	Comments
☐ Unmet needs for data	
☐ New insight offered by data	
☐ Meets new legal requirements	
☐ Meets new program needs	
☐ Positive experience of other agencies	
☐	
☐	

7. Does your agency acquire proprietary data regularly at a system level, or to support a specific project as needed? Elaborate.

8. Does your agency have a data business plan?

   ☐ Yes. Could you provide a copy (file upload or email)? _____

   ☐ In development.

   ☐ No.

9. Does your agency have an annual budget for the data acquisition? Elaborate.

10. What concerns does your agency have about acquiring proprietary data?

Concerns	How do you address these concerns?
☐ Finding the right product to meet the needs	
☐ Legal and privacy concerns	
☐ Limited funding	
☐ Staff expertise	
☐ Data quality concerns	
☐ Requirement on IT infrastructure	
☐	
☐	

11. What roles do each party play in the acquisition process? Specify the division within your agency that handles the acquisition and RFP, if applicable.

Data Item	Who is involved with data acquisition?	Who issues the RFP?	Who owns the data?	Comments
Example	*DOT Planning Division, University*	*University*	*University and DOT*	

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12. Does your agency have formal guidelines to evaluate vendors and products?

    ☐ Yes. Could you provide a copy (file upload or email)? _____

    ☐ No.

13. What criteria are used, or what questions does your agency ask, when evaluating vendors and products? What would you do differently if you were to start over? Please respond for each data item, if applicable.

14. Does the licensing agreement or executed contract restrict the use of data for certain applications only? What are they? Skip this question if you have provided a copy of your licensing agreement or contract.

15. Are there any applications that your agency would like to use proprietary data for but cannot due to licensing restrictions? If so, what are they?

16. Is the data license perpetual? Are there restrictions on the number of users who can access the data? Skip this question if you have provided a copy of your agency's licensing agreement or contract.

17. What is the data sharing and/or publication policy regarding the original data and derived works? Can the original data be shared with other agencies, contractors, researchers, and the general public? If yes, is there a user agreement that you require before sharing the data? Skip this question if you have provided a copy of your agency's licensing agreement or contract.

18. How do you address possible conflicts between non-disclosure agreements with data vendor(s) and the requirement of open record laws at federal, state, and local levels?

19. How does your agency handle privacy concerns that may arise due to the disclosure of proprietary data?

20. How does your agency handle other concerns that may arise under special circumstances, such as an emergency evacuation, during which DOTs may be required to share real time data with emergency operators?

21. Are there any other terms not mentioned above but are included in your licensing agreement or contract? Skip this question if you have provided a copy of your licensing agreement or contract.

22. What did you learn from past data acquisition that you would change in future acquisitions?

The survey is complete. Thank you for your participation!

APPENDIX B

Interview Guides

In addition to clarifying with the interviewed agencies on their responses, and seeking responses on some unanswered questions in the broad agency survey, the interviewees were asked to elaborate on

1. How did your agency decide to acquire the third party data set(s)?
2. Why did your agency decide to use the particular approach (agency RFP, joint RFP with other agencies, contracting through a third party, sole source) for acquisition?
3. What do you see as the most important benefit this data bring to your agency, or division?
4. Has the data provided you with the answers you are seeking?
5. If another agency is considering going through the same process for the same data, what would be your advice to them?
6. Do you have any suggestions on how to improve cost effectiveness of the acquisition?

APPENDIX C

Survey Respondents and Interviewees

Agency	Title
Alabama	Planning Coordinator
Alaska	Transportation Data Program Manager
Arizona	TSM&O System and Technology Group
Arkansas	Staff Research Engineer
California	Geospatial Data Officer
Delaware	Delaware Director of Technology and Innovation
Florida	Manager
Georgia	IT Administrator; and Director of Information Technology/CIO
Hawaii	Engineer V, Hawaii DOT/Highways Division
Idaho	PRINCIPAL RESEARCH ANALYST, ECONOMIST
Indiana	IT Director
Iowa	Director, Office of Research and Analytics, Strategic Performance Division
Kansas	Assistant to the Director of Planning and Development
Kentucky	Assistant State Highway Engineer
	ITS Engineer
Louisiana	Data Collection and Management Systems Administrator
Maine	Assistant Director
Maryland	Chief - Data Governance Division
Michigan	Interim Chief Data Steward
Minnesota	Research Analyst Specialist
Mississippi	Chief Information Officer, State Planning Engineer
Missouri	Traffic Management & Operations Engineer
Montana	CIO
Nebraska	IT Supervisor
Nevada	Chief IT Manager
New Hampshire	
New Jersey	TSM Program Manager

Agency	Title
New Mexico	Division Director
North Carolina	GIS Manager / Data Czar
North Dakota	Planning/Asset Management Division Engineer
Ohio	Managing Director Infrastructure, ITS Engineer
	SPR Administrator
	Travel demand modeler
Oklahoma	Strategic Asset & Performance Management Division Engineer
Oregon	Strategic Data Program Manager
Pennsylvania	DW/BI Section Chief
South Dakota	Planning Engineer, SDDOT / Planning & Engineering
Tennessee	Assistant Director, Long Range Planning Division
Utah	Director of Program Development
Virginia	Associate Director, Safety, Operations, and Traffic Engineering, Virginia Transportation Research Council
	Conceptual Planning, Transportation and Mobility Planning
Washington	Assistant Director, Performance Management; Assistant Director, Data Management
West Virginia	Statewide and Urban Planning, Unit Leader
Wisconsin	Chief, Data Management Section
Wyoming	Planning Engineer
ARC	Performance Analysis and Monitoring Manager
	Acquisition and Budget Manager

APPENDIX D

Sample RFPs

This appendix contains four RFPs issued by Michigan, Ohio, and Arizona DOTs for acquiring speed and OD data. They are provided as references and to demonstrate current RFP practices at state DOTs for different types of data acquisitions. The RFPs have specific data quality requirements, use and sharing policy specifications, criteria and their weights on vendor/product solicitation, cost proposal requirements, as well as payment penalties contingent on the data quality.

APPENDIX D1 MICHIGAN DOT SPEED DATA RFP

Michigan Department of Transportation

SCOPE OF SERVICE
FOR
SPECIALTY SERVICES
Real-time Traffic Data & Performance Analytics
Best Value

CONTROL SECTION: 84900

JOB NUMBER: 116389

PROJECT LOCATION:
Various locations throughout the state of Michigan, including MDOT Bay, Grand, Metro, North, Southwest, Superior and University Regions.

PROJECT DESCRIPTION:

The two tasks to be accomplished by this project are:

Provide real-time traffic data for freeway routes in the State of Michigan for use by the Michigan Department of Transportation (MDOT) and its partners.

Provide a web-based Transportation Performance Measure Reporting and Analysis System (TPMRAS)

PRIMARY PREQUALIFICATION CLASSIFICATION(S): N/A

SECONDARY PREQUALIFICATION CLASSIFICATION(S): N/A
ANTICIPATED SERVICE START DATE: July 1, 2017

ANTICIPATED SERVICE COMPLETION DATE: June 30, 2020

PREFERRED QUALIFICATIONS AND CRITERIA:
The Contractor shall have a minimum of five related projects working with state government, local municipalities, or international equivalent over the past five years providing real - time traffic data for freeway routes.

The Contractor shall display extensive software experience, including working knowledge of data feeds including but not limited to; extensible mark-up language (XML) average speed, traffic, incident, construction, weather data and other traffic information. The selected Contractor must also display a highly developed ability to work with multiple teams on complex projects. The selected Contractor will have performed planning, installation, and support services for

similar software and installations for other DOTs, including procurement, installation, configuration, and operation of the software. Including minimum five years of previous experience with supplying state government, local municipalities, or international equivalents with similar software.

MDOT PROJECT MANAGER:
Elise Feldpausch, P.E.
Michigan Department of Transportation
8885 Ricks Rd.
P.O. Box 30049
Lansing, MI, 48917
517-636-0036
feldpausche1@michigan.gov

REQUIRED MDOT GUIDELINES AND STANDARDS:
Work shall conform to current MDOT, FHWA, and AASHTO practices, guidelines, policies, and standards.

GENERAL INFORMATION:
The Contractor shall furnish all services and labor necessary to conduct and complete the services described herein. The Contractor shall also furnish all materials, equipment, supplies, and incidentals necessary to perform the Services (other than those designated in writing to be furnished by the Department) and check and/or test the materials, equipment, supplies and incidentals as necessary in carrying out this work. The Services shall be performed to the satisfaction of the Department consistent with applicable professional standards.

The Contractor shall comply with all applicable Federal and State laws, rules, and regulations. The Contractor's staff shall conduct themselves with professionalism in carrying out their duties.

The Contractor shall notify the Project Manager, in writing, prior to any personnel changes from those specified in the Contractor's original approved proposal. Any personnel substitutions are subject to review and approval by the MDOT Project Manager.

At the request of the Department, the Contractor, during the progress of the Services, shall furnish information or data relating to the Services described herein. These may be required by the Department to enable it to carry out or to proceed with related phases of the Project not described herein, or which may be necessary to enable the Department to furnish information to the Contractor upon which to proceed with further Services.

For purposes of clarity and clarification this RFP will be broken down into two components; 1) the acquisition of Real-time Traffic Data for the State of Michigan and 2) the acquisition of a TPMRAS.

1) REAL-TIME TRAFFIC DATA

MDOT's ITS program has historically focused on the State's urban centers of Detroit and Grand Rapids where two of the four existing transportation operations centers (TOCs) and the vast

majority of ITS assets are located. Beyond these two urban centers, however, MDOT has been expanding its ITS footprint throughout the entire State, recognizing that safe and efficient recreational and inter-city travel is critical to the state's economy. Advanced Traveler Information System (ATIS) is being deployed throughout the state to provide better traveler information to assist drivers with making more informed route choices. In order for the system to function properly the necessary data must be collected to make accurate and timely traffic management decisions. These decisions are made possible through the use of innovative nonintrusive traffic data collection techniques.

There are two primary objectives of this portion of the procurement:

The first objective of the project is for the acquisition of a subscription-based real-time, travel time service for all available segments. The data being supplied should be accurate, real-time, and reliable and must reflect actual traffic conditions. This data will enhance MDOT operations and provide for a more informed and reliable driving experience through the dissemination of information. The accuracy and timeliness of the data will play a major role in the public perception of the system. Therefore, in order for the system to be effective the data reported must reflect the actual conditions. The provided traffic data will be displayed in real-time on a publicly available web-based traveler information system such as the Mi Drive website (www.michigan.gov/drive). The traffic data will also be used to calculate travel times for MDOT routes on Dynamic Message Signs (DMS) in real time using MDOT's Advanced Traffic Management System (ATMS) software.

The second objective is for access to a historical archive of traffic data for operational planning and research purposes. This data will be used to analyze MDOT's highway performance to determine if the department is meeting its performance measurement goals utilizing the acquired TPMRAS as defined in this RFP.

Independent Validation
The Contractor shall agree to cooperate with data validation either by MDOT or an independent contractor of MDOT's choosing. The independent validation tests may use any combination of floating car runs, vehicle detection technology, Bluetooth and/or Wi-Fi re-identification technology to verify Contractor data.

MDOT will enforce the data quality requirements and the quality targets included in this contract. MDOT will impose data quality requirements short of contract termination for the first infraction. If validation tests indicate that the Contractor has not met the data requirements for a particular time frame, a percentage of or the entire payment for that period shall be retained by MDOT. If the Contractor does not meet the data validation requirements the following period, MDOT shall have the right to withhold further payment, renegotiate or terminate the contract. Included in Appendix A is a detailed metric as to how validation is to be accomplished and the associated payment penalties. The Contractor shall disclose any changes that may improve or reduce data quality including, but not limited to gaining or losing a key fleet of vehicles or a cellular carrier contract. In the event that a key data source becomes unavailable, data quality requirements will still remain in place.

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Data Usage

All data provided by the Contractor shall be available for full use by MDOT, its partners and consultants for any traveler information purposes including DMS, potential future 511 services, potential future Connected Vehicle (CV) applications, websites including, but not limited to, MI Drive, highway performance measurement tools including the acquired TPMRAS, for archiving to be used in future MDOT planning, evaluation and research, system performance measures required by MAP-21 and the FAST act, and for future unforeseen uses. MDOT cannot resell any data provided by the Contractor. The Contractor retains the right to use the collected data for any use including traveler information and reselling and archiving. In the event the Contractor resells or makes public data that employs MDOT-owned detectors, credit or recognition shall be given identifying MDOT in connection with the data. Data may be made available to a consultant or systems integrator on the basis that the data is to be used strictly for planning and or engineering purposes to benefit MDOT. Non-MDOT agencies wishing to use the data may be subject to a non-disclosure clause. However, MDOT will not be held liable nor responsible to develop or enforce a non-disclosure clause. All data shall be available for viewing in real-time. At the end of each quarter-year, while the contract is active, the Contractor shall provide MDOT with a CD(s), DVD(s), USB flash drive(s) or external hard drive containing all of the collected data within that year for continued use.

Valid Sources of Data

This traffic data may come from a variety of sources and bidders are encouraged to propose innovative approaches to traffic data collection that fulfill the requirements of MDOT as detailed in this Request for Proposals (RFP). It is intended that this data will support the provision of inter-city traveler information, system performance measures and support MDOT's ability to manage traffic in the coverage area. The successful bidder will enter into an agreement with MDOT for the provision of real-time traffic data for three years on routes specified in this RFP, with the potential contract terms.

The Contractor shall clearly explain the proposed sources of data where they will apply, and how one or more will be used to derive a single estimate for each segment in each reporting period. MDOT will allow any combination of the following data sources:

- Real-time probe based data;
- Historical data;
- Forecasting or modeling; and
- MDOT owned real-time infrastructure-based data (access to live MDOT microwave vehicle detection system (MVDS) data).

The Contractor is required to integrate the real-time data from MDOT MVDS in existing formats or schemas into the Contractor's real-time data feed. Documentation on real-time detector locations and data access will be supplied to the Contractor upon request. Any processing or formatting required additional to the supplied data will be the responsibility of the Contractor. The Contractor shall ultimately be held responsible for meeting all data requirements. MDOT is not liable for failed or inaccurate data from its detectors. In the event that the Contractor obtains new sources of data, these may be incorporated into the system at no additional cost to MDOT. Additionally, MDOT may make available to the Contractor new data sources where feasible.

2) Transportation Performance Measure Reporting and Analysis System

The Contractor will provide a web-based Transportation Performance Measure Reporting and Analysis System (TPMRAS) that will integrate the real-time traffic data provided in this contract and other associated MDOT provided transportation data. This will allow MDOT to manage, visualize, interpret, report and make actionable use of its transportation data by allowing MDOT to evaluate the traffic impacts of incidents, construction, special events, etc. This system will enable MDOT to establish baseline performance metrics and be able to better identify and efficiently respond to re-occurring and abnormal conditions.

The MDOT provided transportation data includes but is not limited to the following: construction, incident, and crash data, Road Weather Information System (RWIS) data, Microwave Vehicle Detection Systems (MVDS) data, Permanent Traffic Recorder (PTR) data, Closed-Circuit Television (CCTV) video feeds and Dynamic Message Signs (DMS) messages.

TPMRAS shall also include the National Performance Management Research Data Set (NPMRDS) or approved FHWA equivalent to be able to create system performance measures and targets based on the MAP-21 and FAST Act requirements.

CONTRACTOR RESPONSIBILITIES:

1) REAL-TIME TRAFFIC DATA

The Contractor must adhere to all applicable OSHA and MIOSHA safety standards, including the appropriate traffic signs for the activities and conditions for this job and adherence to the Personal Protective Equipment (PPE) standards.

The Contractor shall meet with the MDOT Project Manager to review project, location of data sources and contact persons, and review relevant MDOT operations. The Contractor shall review and clarify project issues, data needs and availability, and the sequence of events and team meetings that are essential to complete the design by the project plan completion date. Attention shall be given to critical target dates that may require a large lead time.

Scope of Contractor Duties
The Contractor shall provide a Project Work Plan within ten business days of notice to proceed. The project work plan will include:

- A project schedule that outlines all necessary steps required to provide the real-time traffic data in this RFP. This includes the identification of interim deliverables and reviews required of MDOT. The schedule will include key milestones and the commencement date for the delivery of real-time traffic data feed will be part of the schedule.
- A quality assurance/quality control (QA/QC) plan that describes the Contractor's plan for monitoring and maintaining data quality and coordination with MDOT and any potential independent validation Contractor.

The Contractor shall submit monthly progress reports by the fifth business day of the next month.

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Monthly progress reports will include, at a minimum, all key information affecting the quality, availability or reliability of the data feed in the previous month. For any issues that arise, the Contractor shall present a plan for how they will be resolved. Any formal request made to the Contractor to investigate inconsistent or questionable data must be responded to within seven calendar days. The monthly progress reports must also include any changes made to the real-time traffic data such as mapped segments and reference speeds.

The project will begin with a formal in person kick-off meeting, to review the project work plan and provide an opportunity for MDOT and the Contractor to share expectations for the project.

I. Real-Time Traffic Data Requirements

A. Data Format.

1. The real-time data shall be provided in Extensible Markup Language (XML) format, using an MDOT approved schema.

2. The real-time data shall be provided in Comma Separated Values (CSV) format.

3. The real-time data files shall be delivered via Hypertext Transfer Protocol (HTTP) or another standard protocol.

B. Data Elements.

1. Raw segment speed in miles per hour to the nearest integer shall be a reported data element. This shall be "raw" data, without processing for smoothing.

2. Smoothed segment speed in miles per hour to the nearest integer shall be a reported data element. At a minimum, the smoothing process shall cap speeds at the speed limit.

3. Raw segment travel time to the nearest whole second shall be a reported data element. This shall be "raw" data, without processing for smoothing.

4. Smoothed travel time to the nearest whole second shall be a reported data element. At a minimum, the smoothing process shall truncate travel times to not imply greater than speed limit travel

5. A confidence interval shall be a reported data element. The confidence interval shall indicate the reliability of each segment speed and travel time. A definition of the confidence interval must also be supplied.

C. Definition of Segments.

1. Segment definition shall be based on logical breaks in facilities where one would expect the potential for differing traffic conditions such as an interchange, intersection, a lane drop or a major at grade intersection.

2. Segment definitions shall at a minimum contain beginning and ending latitude, longitude, heading, common name or route number, and a unique identifier (such as a Traffic Message Channel (TMC) code).

3. When individual probe speeds within a segment vary, speed data should be supplied for shorter, sub-segments that are approximately 1 mile in length. This ability must be provided for at least 80% of all segments statewide.

4. A segment definition file shall be provided and updated as changes are made (i.e. when ramps are added and geometry changes).

5. Segment definitions shall conform to applicable standards or comparable open and published data standards.

6. Segmentation shall be translatable to the Michigan Geographic Framework (see http://www.michigan.gov/cgi).

7. The segment definition file shall be in XML format in an MDOT approved schema.

8. The segment definition file shall be in CSV format.

9. Route Coverage. The Contractor shall provide traffic data for all segments statewide.

10. Update Interval. The data shall be updated once every 2 minutes.

D. Accuracy.

1. Absolute average speed error shall be evaluated individually in separate speed buckets of 0-30 MPH, 31-50 MPH and 51+ MPH.

2. The average speed error shall be within +/- 10 MPH for each speed bucket

E. Completeness.

1. The Contractor shall provide data quality indicators on completeness for each speed bucket.

2. Completeness shall be reported as the percent of segments with data per update interval.

3. Traffic data shall be provided for at least 95% of all segments at all required time reporting intervals.

F. Data Availability.

1. The Contractor shall provide traffic data 24 hours a day 7 days a week, with allowances made for up to 40 hours of scheduled system maintenance per year during off hours. The Contractor shall not perform scheduled maintenance without prior approval from MDOT 24 hours before the scheduled maintenance.

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2. Apart from scheduled downtime, the Contractor shall maintain an overall data availability of at least 99.5 percent in each calendar month of the contract.

G. Latency.

1. The Contractor shall maintain a maximum data latency of 10 minutes or less (minimum).

2. The Contractor shall maintain a maximum data latency of 5 minutes or less (desired).

II. Historical Traffic Data Requirements

A. At the end of each quarter-year, while the contract is active, the Contractor shall provide MDOT with a CD(s), DVD(s), USB flash drive(s) or external hard drive containing all of the collected data within that year for continued use.

2) TRANSPORTATION PERFORMANCE MEASURE REPORTING AND ANALYSIS SYSTEM

Provide a web based performance measures program for unlimited users by state and contract employees. Allow other Michigan governmental entities access, and enable ability for MDOT to set up different access restrictions. Transportation Performance Measure Reporting and Analysis System TPMRAS must include the following requirements upon execution of the contract.

I. Data Requirements

A. Compatible with a standard XML feed for probe average speed data supplied to MDOT and incorporate all available segments and meet requirements identified in this RFP.

B. Supply capacity to store a minimum of 10 years of all collected data and import existing data starting from January 1, 2012 to the present date.

C. Incorporate National Performance Management Research Data Set or FHWA equivalent.

D. Incorporate Annual Average Daily Traffic (AADT) and Commercial Average Daily Traffic (CADT) if available, as provided by MDOT and updated annually.

E. Incorporate incidents and construction data as provided by MDOT and overlap them on applicable tools.

F. Overlay incident, construction and weather radar on speed data.

G. Incorporate data including but not limited to RWIS, MVDS, DMS and CCTV video feeds provided by MDOT.

II. Functionality Requirements

All tools for performance measures have the ability for the user to:

A. Select various time frames by day, week, month, and year with a granularity down to 5 minutes unless specified otherwise.

B. Pull performance measures by route, route segment, region, by custom road mile marker and Physical Road (PR) mile points.

C. Manipulate segment sets into groups to make it easy to perform segment specific reports or to help with repeated data pulls. These sets should have the ability for other users to use and the ability to sort.

1. Ability to have a reserved set of users who retain administrative rights including the ability to delete segment sets.

D. Save the performance measures as a picture file, xml file and video file if applicable, and the ability to share links with other users.

E. Access help pages at a minimum that explain how the performance measures are calculated and what data is being used.

F. View all state routes, their current speeds, speed as a percentage of the historic average speed for that time of day and day of week, weather, incidents and construction in a map view.

1. Includes ability to see these measures in a previous point in time.

G. Access tools to implement MAP-21/FAST Act system performance measure requirements that utilize the NPMRDS or equivalent.

H. Alert MDOT of abnormal speed conditions compared to reoccurring congested conditions via email or text messages. Include the ability to send alerts to multiple people. Ability to select speed, location and time thresholds for when alerts should be sent.

I. Compare all measures with previous selected data, i.e. comparing different years to each other.

III. Map Requirements

A. Generate a heat map which shows speeds/speed as a percentage of historic average/speed as a percentage of posted speed limit and reliability measures.

1. Tool must have the ability to change colors based on speed or other selectable data type.

2. Must have the ability to select multiple roadways and show one or both directions at the same time.

B. Generate animated maps showing changes in speed over a specific day/week/month/year.

1. Tool must have the ability to change colors based on speed or other selectable data type.

2. Have the ability to select multiple roadways.

IV. Reporting Requirements

A. Ability to calculate user delay costs based on the user selected speed thresholds and the ability to select what speed to calculate against at a minimum the posted speed limit and historical average.

1. The user delay costs is based on an hourly rate, AADT (each updated annually) provided by MDOT. Contractor will be responsible for updating calculations when new hourly rate is provided.

2. User delay costs must be reported out by the hour at a maximum but the calculations must use average speed increments of 10 minutes or less to reduce washing out the data.

B. Generate reports on speed data; length and duration below a certain speed.

C. Generate reliability measures summaries including buffer time, buffer index, planning time, planning time index, speed, travel time and travel time index.

D. At a minimum be aggregated by hour but not limited to on the hour (ie 7:15-8:15) and the ability to group by day of week, weekday, weekends and by direction of traffic.

E. Generate a bottleneck ranking report.

1. Ability to list and rank bottlenecks, how often they occur, average duration, maximum queue, volume and sort by each criteria.

F. Generate reports on travel time, number of delays over various time thresholds, and user delay costs by time of day and position on route.

G. Generate line graphs of speed and reliability measures.

1. This should include at a minimum 95th and 80th percentiles and average speeds with the ability to separate by traffic direction or time period.

2. Granularity at a 2 minute minimum.

3. Should have the ability to select multiple roadways.

H. Historic average speeds to be calculated on a yearly basis. The previous 3 years of data should be shown when comparing data.

I. Create exportable charts and interactive maps of speed data by time of day and by position on route. Include data quality metric as provided to the state by the probe data average speed data vendor. This includes the ability to eliminate historical data when confidence of the probe average speed data is low.

V. **Export Requirements**

A. Ability to export raw probe data as a CSV file including the ability to select various time periods, ability to average the probe data at various increments between 2-60 minutes.

B. Must be able to export data in excel form and export maps/graphs.

VI. Additional Requirements:

Any of the following additional requirements identified below that are not available upon time of submittal must be integrated within 2 months of the contract start date. The Contractor must provide an integration plan and timeline for each of these requirements.

A. Incorporate real-time MVDS data and have the ability to adjust AADT to calculate User Delay Costs. Ability to select specific MVDS sites and see real time readings.

B. Develop a map based segment selection process.

C. Ability to automatically generate daily, weekly and monthly reports for various performance measures. The ability to report on specific segments over a specific time frame and save query per user.

D. Create annual Congestion & Mobility report and poster with performance measures/charts/maps, using metrics as specified by MDOT. See website below for previous reports. http://www.michigan.gov/mdot/0,4616,7-151-9622_11045_25024_75677---,00.html

E. Develop a tool to calculate congestion which is calculated as multiplying the number of hours congested (No/Low, Moderate, Severe) by the segment length. Example, greater than 55 mph is No/Low, 35 mph to 55 mph is moderate and less than 35 mph is severe.

3) TRAINING

Contractor may be requested provide training for any other software necessary to meet the requirements of this Proposal. All training will meet or exceed the requirements listed below.

A. Course materials shall be approved by MDOT at least 10 calendar days prior to the training.

B. Training shall be conducted by classroom style or webinar, as agreed upon by MDOT.

C. Training shall be provided to both MDOT staff and other agencies as deemed appropriate by MDOT.

D. Training shall cover the use of all computer software and web-based applications.

MDOT RESPONSIBILITIES:

1. Schedule and/or conduct the following:
    a. Project related meetings
    b. Stakeholder engagement meetings
2. Make decisions or provide input for the following items:
    a. Resolve issues related to funding
    b. Review and approve all budget and schedule aspects

TRAFFIC CONTROL AND MDOT PERMITS

N/A

PROJECT MANAGEMENT:

1. This project will require close interaction and good communication between the Contractor and multiple MDOT staff.
2. If there are any major deviations from the original scope of this assignment, these changes must be documented and jointly approved by the Contractor and MDOT.
3. The selected Contractor shall provide all necessary project management services, including monthly and quarterly progress reports, and providing invoices in a timely manner.
4. Contractors should provide a description of their management team for this project and list all key personnel responsible for the deliveries of this RFP.

STATUS REPORTS/ MEETINGS:

1. There shall be periodic, regular meetings between MDOT representatives and the selected Contractor to review work product and to communicate progress, issues, ideas, and expectations.
2. The Contractor will be responsible for scheduling, agenda creation, meeting minutes etc.
3. The Contractor shall provide copies of all project reports, correspondence, meeting announcements, and meeting minutes from all meeting attended, which shall be delivered by email to the MDOT Manager. These shall be distributed by email to the MDOT Project Manager.

PROJECT DOCUMENTATION:

All documentation and reports shall be delivered in the current version of Microsoft Excel, Microsoft Word or Adobe Acrobat (whichever applies) being used by MDOT. All documentation

delivered shall be clear, concise, complete, and in compliance with standards required by the MDOT Project Manager.

CONTRACTOR PAYMENT – Unit Price:

Compensation for this project shall be on a **unit price** basis. This basis of payment typically includes a maximum quantity of units and a maximum reimbursable cost per unit.

All billings for services must be directed to the Department and follow the current guidelines. Payment may be delayed or decreased if the instructions are not followed.

Payment to the Contractor for services rendered shall not exceed the maximum amount unless an increase is approved in accordance with the contract with the Contractor. Typically, billings must be submitted within 60 days after the completion of services for the current billing. The final billing must be received within 60 days of the completion of services. Refer to your contract for your specific contract terms.

SCORING POINT ASSIGNMENT:
Total Points = 130 Points

Proposed Selection Criteria and Total Possible Points:
Understanding of Service – 30 Points
Describe your understanding of the service to be provided.

Qualifications of Team – 40 Points
Describe your team and the roles of key personnel. Provide resumes for key personnel.

Past Performance – 20 Points
Provide references and examples of similar work performed for other agencies.

Location – 5 Points
Indicate the percentage of work that will be performed in Michigan.

Presentation – 20 Points

Price –40 Points
Formula: Low Bid/Bid * points assigned
Completed bid sheet required.

BID SHEET
Specialty Services for MDOT Real-time Traffic Data & Performance Analytics
MDOT STATEWIDE
PAYMENT ITEMS
(All entries made on this page shall be handwritten in ink)

Contract Year 1

ITEMS OF WORK		UNIT	QUANTITY	PRICE/UNIT	TOTAL PRICE
1	Real-time Traffic Data	Month	12		
2	Operate and Maintain TPMRAS	Month	12		
3	Enhancements*	Dollar	$50,000		

Contract Year 2

ITEMS OF WORK		UNIT	QUANTITY	PRICE/UNIT	TOTAL PRICE
1	Real-time Traffic Data	Month	12		
2	Operate and Maintain TPMRAS	Month	12		
3	Enhancements*	Dollar	$50,000		

Contract Year 3

ITEMS OF WORK		UNIT	QUANTITY	PRICE/UNIT	TOTAL PRICE
1	Real-time Traffic Data	Month	12		
2	Operate and Maintain TPMRAS	Month	12		
3	Enhancements*	Dollar	$50,000		

CHECK UNIT PRICE COLUMN FOR OMISSIONS BEFORE ENTERING BID TOTAL

*Not to exceed amounts. Payment to be made based on actual cost

Bid Price for the above listed items and quantities: $_____

CONTRACTOR'S NAME: _____

CONTRACTOR'S SIGNATURE: _____

DATE: _____

VALIDATION PROCESS AND PAYMENT PENALTIES

In accordance with section 6.1 of the RFP, data validation is required and subsequently if the data requirements are not met then penalties will be assessed. The following section details how these penalties are accessed and the necessary actions that MDOT may take to provide the best possible traffic data for the State. Data validation shall be tested based on several components, each with their respective percentage. If the subscription data does not fall within the allotted limits of the ground truth validation data a percentage of the maximum award fee shall be withheld up to 100 percent of the maximum award fee for that component. Validation will be performed on the raw (non-smoothed) data provided by the Contractor.

Award Fee Component:	Max Reduction	Actual Reduction	
1. Data Availability < 99.5%	40 %	%	
2. Data Accuracy +/- 10 MPH	40 %	%	
3. Data Latency > 5 Minutes*	20 %	%	
Total Reduction		%	
Max Payment		$	(from cost proposal)
Actual Payment		$	(max payment X total reduction)

* A latency of 5 minutes or less is desired, however if the selected offer is only able to propose a maximum latency of 10 min, this payment structure shall be modified to not penalize a latency under 10 minutes.

Data Availability:
The Contractor is required to maintain overall data availability on a per monthly basis of 99.5 percent, which does not include any scheduled maintenance. If MDOT should receive 99.5 percent of all the data reports for a particular month the vendor shall be award the maximum allotted amount reserved for the data availability component. Should the Contractor report less than 99.5 percent of the total reports for that particular month the maximum monthly payment shall be reduced based on the following table.

Percent Available	Reduction
99.5 or greater	0 %
99.49 or less	40 %

Data Accuracy:
System accuracy shall be evaluated based on the average absolute speed error. Section 2.1 of the RFP requirements states that the average speed error shall be +/- 10 MPH within each of the three ranges of speeds. The calculation method for the average absolute error is as follows:

Let: A_{ij} = Speed data for link *i* at time *j* from the data service.
B_{ij} = Corresponding speed from the validation data
Average Absolute Speed Error = mean($|A_{ij} - B_{ij}|$)

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Ground truth speed data shall be collected at various times on MDOT selected segments which shall coincide with the Contractor's segment definitions. These segments will then be compared with the Contractors reported data to verify its accuracy. For all evaluation data the speeds shall be rounded to the nearest whole integer. The following table is provided as a guide for the evaluation process.

Sample No.	Date	Day	Time	Length (mi)	Route No.	Limits		Data Comparison (MPH)		
						From	To	Contractor Data	Validation Data	Error
1	MM/DD/YY	Mon	00:00	0	#	A	B	0	0	0
2	MM/DD/YY	Mon	00:00	0	#	B	C	0	0	0
3	MM/DD/YY	Mon	00:00	0	#	C	D	0	0	0
4	MM/DD/YY	Mon	00:00	0	#	D	F	0	0	0
5	MM/DD/YY	Mon	00:00	0	#	F	G	0	0	0
6	MM/DD/YY	Mon	00:00	0	#	G	H	0	0	0
Average of the absolute values of the errors:										Avg.

Average Difference	Reduction
+/- 10 or less MPH	0 %
+/- 10 or greater MPH	40 %

In addition to ensuring the average reported data is with an acceptable range, anomalies may occur in the reported data. These will be defined as instances when errors exceed 20 MPH. These anomalies may not raise the average enough to be greater than +/- 10 MPH. However, when reporting travel times to the public it is imperative that these anomalies not be reported at all. Therefore if data anomalies of 20 MPH or greater are reported then a percent reduction off the maximum attainable amount is incurred. The penalty shall be assessed on a percent basis which the following table identifies.

% Of Data Records with Absolute Error > 20 MPH	Percent Reduction
0-5 %	5 %
5-10 %	10 %
10-20 %	20 %
Greater than 20 %	40 %

Data Latency:

System latency shall be validated using the three speed buckets outlined in the requirements table. These speed buckets are as follows: of 0-30 MPH, 31-50 MPH and 51+ MPH. The determiner of latency will be the time it takes for the subscription data to recognize a change from one bucket to the next, as compared to ground truth data. The following table outlines the percent reduction off the maximum available payment for this component based on latency.

Time Difference	Percent Reduction
5 Minutes or less	0 %
5+ Minutes	20 %

* - A latency of 5 minutes or less is desired, however if the selected offer is only able to propose a maximum latency of 10 min, this payment structure shall be modified to not penalize a latency under 10 minutes.

APPENDIX D2 OHIO DOT SPEED DATA RFP

RFP No. 521A-16

REQUEST FOR PROPOSAL #521A-16
SPEED DATA SERVICES

Issue Date: 4/25/2016

Question/Inquiry Deadline: 5/3/2016 @ 2:00 p.m. eastern time

Proposal Response Deadline: 5/10/2016 @ 2:00 p.m. eastern time

Ohio Department of Transportation
Request for Proposal No. 521A-16
Speed Data Services

Proposal Purpose

The Ohio Department of Transportation (ODOT), Office of Traffic Operations (OTO) is seeking the services of either one Proposer or multiple highly qualified Proposers to provide non-intrusive real-time traffic speed data collection in real-time over approx. a three (3) year contract period to cover 2,374 centerline miles in Ohio, as well as historical speed data on a minimum of 15,000 centerline miles and shall include all State, US and Interstate Routes. The Proposer(s) shall provide historical speed/travel time information to ODOT for every route in Ohio for which they have coverage.

Speed may be collected in any method and shall be technology agnostic. Proposers must clearly indicate in their proposals how data will be collected and transferred to the Department. For example, speed may be directly measured using technology such as Doppler Radar or collected using probe based collection methods such as GPS, mobile devices, etc. Real-time data shall be provided as close to real-time as possible. Historical speed data shall be provided "near real-time" with ability to access data for time periods as recent as one hour old, as a minimum.

This Request for Proposal has been organized into the following nine (9) major components:

1. Speed Data Service Requirements
2. Proposal Response Requirements
3. Proposal Evaluation and Contract Award
4. Terms and Conditions for Bidding
5. Proposer Certification Form
6. Supplemental Terms and Conditions
7. Signature Page
8. Appendix A
9. Appendix B

RFP No. 521A-16

1. SPEED DATA SERVICE REQUIREMENTS

NOTE: YOU MUST PROVIDE AN IN-LINE RESPONSE INDICATING IN DETAIL HOW YOUR SOLUTION MEETS OR EXCEED THE REQUIREMENTS. PLEASE USE RED TEXT IN YOUR RESPONSES TO EACH REQUIREMENT. SEE SECTION 2.1 IN THE PROPOSAL RESPONSE REQUIREMENTS FOR INSTRUCTIONS ON HOW TO DOWNLOAD THE .DOCX WORD VERSION OF THIS RFP.

Section 1: Background

Real-time speed information is required for areas where ODOT has existing speed data coverage under a current contract and in other areas where ODOT does not have existing speed data coverage. ODOT's current real-time speed data contract expires June 30, 2016. This contract shall replace the existing contract for Part 1 real-time speed data coverage and will add new real-time speed data coverage under Part 2. Historical speed data is required on a minimum of 15,000 centerline miles and shall include all State, US and Interstate Routes under Part 3.

(PROPOSER IN-LINE RESPONSE REQUIRED)

The three parts are described in more detail below in Section 2.0 and maps of the coverage areas are provided in Appendix B. The Part 1 coverage areas include mostly interstates and freeway look-alike routes throughout the entire State of Ohio.

The Part 2 coverage areas include select sections of US and State Routes.

ODOT will use an internal travel time algorithm to calculate travel times based on the real-time speed information received. The travel time information will then be disseminated using multiple ODOT features, including but not limited to; Buckeye Traffic and OHGO websites, 511 caller information system, permanent Dynamic Message Signs (DMS), Highway Advisory Radio (HAR), etc, The system will also be augmented by Closed Circuit Television (CCTV) cameras and a central software control system. All of these additional features will be provided by other sources. Speed data will be collected continuously.

(PROPOSER IN-LINE RESPONSE REQUIRED)

The system must provide real-time speed data to the ODOT central control system via the Proposer's server(s). ODOT will display the data collected as color coded speed range maps on the OHGO and Buckeye Traffic websites, ODOT's websites for real-time traffic, weather, and construction information. ODOT will evaluate the timeliness and accuracy of the data provided by the Proposer.

(PROPOSER IN-LINE RESPONSE REQUIRED)

Section 2: Delivery Requirements for Speed Data Services

As previously stated, the following three (3) distinct Speed Data Service Parts are included in the scope of this RFP:

Part 1: refers to routes with existing real-time speed data coverage in Ohio.

Part 2: refers to expanded coverage on routes without existing real-time speed data coverage.

Part 3: refers to historical speed data provided "near real-time" and analytics.

Note: The map in Appendix B differentiates between Part 1 routes and Part 2 routes.

Part 1 requires that ODOT must be provided with real-time speed data for all existing coverage areas as specified by July 1, 2016 or unless specified otherwise by ODOT.

The Proposer shall not start billing for the data within these areas at the contract price until after both a successful proof of concept has been completed and not before July 1, 2016.

(PROPOSER IN-LINE RESPONSE REQUIRED)

Part 2 shall provide real-time speed data to ODOT in the as-specified Part 2 expanded coverage areas. Part 2 allows the Proposer to start billing ODOT at the contract price as soon as ODOT starts receiving real-time speed data for the Part 2 coverage areas, on or after July 1, 2016, as long as the requirements in Part 1 are still met. The data availability shall be made as quickly as possible upon award of this contract. The real-time speed data for all Part 2 coverage areas shall be available and compliant with this RFP's requirements by no later than November 1, 2016.

(PROPOSER IN-LINE RESPONSE REQUIRED)

Part 3 shall provide historical speed data on a minimum of 15,000 centerline miles and include all State, US and Interstate Routes. Historical speed data shall be provided "near real-time" with ability to access data for time periods as recent as one hour old (as a minimum). Historical data will be hosted by and accessed through RITIS as described in Section 4.1. ODOT shall begin receiving near real-time historical speed and travel time data no later than August 1, 2016 and shall be able to query data using the RITIS Speed and Travel Time module as explained in Section 4.1. The Proposer shall also supply ODOT with historical speed and travel time data from January 1, 2009 to the present and this data shall be provided and available in the system by October 1, 2016.

(PROPOSER IN-LINE RESPONSE REQUIRED)

Failure to provide speed data by the dates indicated above for Part 1, Part 2, or Part 3, may result in ODOT finding an awarded Proposer in material breach of contract.

(PROPOSER IN-LINE RESPONSE REQUIRED)

Section 3: Description & Qualifications

3.1: Site Description

A list of the specific routes, locations, and data point intervals is provided in Appendix A. Data is to be provided in each direction for all routes. Please note that real-time data must be provided in the "data points" format as described in *Section 4: Data Requirements* due to ODOT technical requirements. Real-time data may be directly measured using technology such as Doppler Radar or collected using probe based collection methods such as GPS, mobile devices, etc. Regardless of the collection method, real-time data must be converted to a "data point" feed adhering to the requirements specified in *Section 4: Data Requirements*.

For Part 1 and Part 2 real-time speed data, separate bid items have been provided for the minimum number of data points required as well as an optional bid item for an increased number of data points that could be provided by the Proposer. For Bid Items 1A and 2A, Proposer shall bid their lowest and best monthly cost to provide the total minimum number of data points shown in Appendix A on a route-by-route basis. For Bid Items 1B and 2B, Proposers able to provide additional data points should provide a total monthly cost for providing an increased number of data points for the same routes in addition to the minimum required data points to be provided for all routes.

(PROPOSER IN-LINE RESPONSE REQUIRED)

For Bid Items 1B and 2B, the actual data points indicated by the proposer on the bid sheet should include all minimum data points shown in Appendix A plus the additional data points the proposer can provide.

(PROPOSER IN-LINE RESPONSE REQUIRED)

For Part 1 services, a minimum of 2 real-time data points must be provided, 1 for each direction, per the distance interval specified in Appendix A. The average data point interval is specified for each route in Appendix A. For roadway sections with an average of 1 mile spacing, the maximum spacing shall not exceed 2 miles between data points. For roadway sections with an average of 2 mile spacing, the maximum spacing shall not exceed 3 miles between data points. For areas where parallel roadways (i.e. Express Lanes and Collector/Distributor sections) exist, additional data points are required as specified in Appendix A.

(PROPOSER IN-LINE RESPONSE REQUIRED)

For Part 2 services, a minimum of 2 real-time data points must be provided, 1 for each direction, per the distance interval specified in Appendix A. The average data point interval is specified for each route in Appendix A. For roadway sections with an average of 1 mile spacing, the maximum spacing shall not exceed 2 miles between data points. For roadway sections with an average of 2 mile spacing, the maximum spacing shall not exceed 3 miles between data points.

(PROPOSER IN-LINE RESPONSE REQUIRED)

For Bid items 1A and 2A, the proposer shall describe in detail the method/technology being used to provide/capture real-time speed data.

(PROPOSER IN-LINE RESPONSE REQUIRED)

For Bid Items 1B and 2B, if additional data points above the minimum requirements can be provided, the proposer shall describe the method/technology being used to provide increased real-time speed data.

(PROPOSER IN-LINE RESPONSE REQUIRED)

For Part 3, the Proposer shall provide near real-time speed/travel time information to ODOT for every route in Ohio for which they have coverage as part of the historical data requirement. This coverage shall be a minimum of 15,000 centerline miles and include all State, US and Interstate Routes. In addition to the Ohio information, speed and travel time information will also be provided for any State & U.S. Routes that enter/exit Ohio from counties into adjacent states one county deep. Information from other states need

only be from routes that are already covered by the Proposer. ODOT shall also be provided at no cost any future additional State or U.S. Routes the Proposer adds to their coverage in both Ohio and the State/U.S. Routes.

(PROPOSER IN-LINE RESPONSE REQUIRED)

There are two appendices included at the end of this RFP. Each one provides details about the individual deployment regions:

Appendix A: Real-time Data Route Tables
Appendix B: Real-time Data Routes Map

3.2: Qualifications

This Section only applies if physical devices are required to collect speed data.

Any contractor or subcontractor performing the installation and maintenance of any radar devices along the roadway must be prequalified in the state in which the work will occur. In Ohio any contractor must be prequalified in Maintenance of Traffic, Signing, and Highway Lighting and/or Traffic Signals – Standard.

(PROPOSER IN-LINE RESPONSE REQUIRED)

Any contractor must also abide by the provisions of the Ohio Department of Transportation 2016 Construction and Material Specifications, Proposal Notes, Supplemental Specifications, and Supplements.

(PROPOSER IN-LINE RESPONSE REQUIRED)

Section 4: Data Requirements

ODOT may reduce the monthly payment and/or find the Proposer in breach of contract if data requirements outlined in Section 4 are not met. The details of the above provision are outlined in the following sub-sections:

4.1 : Speed Data

Real-time and historical speed must be provided and collection of speed data shall be technology agnostic. For example, real-time speed may be measured using Doppler Radar or collected using various probe based collection methods such as GPS, mobile devices, etc. Real-time data shall be provided as close to real-time as possible and historical data shall be provided "near real-time" with ability to access data for time periods as recent as one hour old (as a minimum). For real-time speed data, each data point shall provide an average speed representing an average speed across all directional lanes.

(PROPOSER IN-LINE RESPONSE REQUIRED)

Historical speed data must be provided through the RITIS Speed and Travel Time module. The Proposer is responsible for establishing the contractual relationship with RITIS and providing ODOT with proper access.

(PROPOSER IN-LINE RESPONSE REQUIRED)

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The following analytics tools, at a minimum, must be accessible through a RITIS account:

- Region Explorer
- Massive Raw Data Downloader
- Congestion Scan
- Trend Maps
- Performance Charts
- Performance Summaries
- Bottleneck Rankings
- User Delay Cost Analysis

(PROPOSER IN-LINE RESPONSE REQUIRED)

Historical speed data must include the expected speed. The expected speed must represent the normal speed based on, at a minimum, time of day, day of week, month, season and must be calculated from historical speed data.

(PROPOSER IN-LINE RESPONSE REQUIRED)

4.2 : Data and Format

Speed Data Specification

Data Transfer Protocol: Real-time data must be provided to ODOT in XML format via TCPIP, HTTP, or FTP transfer protocol. TCPIP is the preferred protocol as this allows data to be provided to ODOT as a data feed via a socket-based connection to Proposer-hosted data source. The use of HTTP or FTP by a Proposer must be reviewed and approved by ODOT prior to acceptance as these protocols may require modifications to ODOT's traffic information system (Buckeye Traffic).

(PROPOSER IN-LINE RESPONSE REQUIRED)

Data Transfer Interval: Real-time data must be provided to ODOT at an interval that allows ODOT's traffic information system to generate accurate and up-to-date travel time information. ODOT's traffic information system is designed to receive and process device/speed data every 60 seconds. An interval that is less than or greater than 60 seconds must be reviewed by ODOT prior to acceptance as such an interval may affect the behavior or accuracy of interdependent traffic features in the system.

(PROPOSER IN-LINE RESPONSE REQUIRED)

Data Provided: The Proposer must provide two types of data to ODOT in the data feed: device configuration data and speed data.

(PROPOSER IN-LINE RESPONSE REQUIRED)

If no physical devices are being installed the Proposer must still convert each data point to meet the Device configuration data feed requirements. Device configuration data must contain the current configuration information for each speed data point. Device configuration data does not have to be included in every data feed transfer; however, it must be included whenever a configuration change occurs to any data point. In addition, if the configuration information for a speed data point changes, then the Proposer must include the device configuration data for all speed data points. The Proposer must provide a means for ODOT to request that latest Device Configuration at any time. For

a socket based connection this could simply be sending the latest data point configuration when the socket connection is first established and then only re-sending it when changes occur or when the connection is dropped and re-established.

Speed data must contain a timestamp, data point status, confidence, and traffic speed reading for each speed data point.

(PROPOSER IN-LINE RESPONSE REQUIRED)

The following tables describe the minimum set of device configuration data and speed data that must be provided to ODOT. Any deviations from the minimum set of data described in the following tables must be reviewed and approved by ODOT prior to acceptance as such deviations may require changes to ODOT's traffic information system. Additional data fields may be provided in the feed as long as these minimum data fields are provided and the structure of the feed remains consistent, pending ODOT approval. The ODOT Division of IT (DoIT) will be assisting with this approval process.

(PROPOSER IN-LINE RESPONSE REQUIRED)

The Proposer shall submit detailed information of any additional fields being provided and the data format and XML structure they will be provided in.

(PROPOSER IN-LINE RESPONSE REQUIRED)

Device Configuration Data	
Data field	**Description**
Date	Date stamp for the device configuration data. This timestamp should reflect the date of the most recent changes to the device configuration.
Time	Time stamp for the device configuration data. This timestamp should reflect the date of the most recent changes to the device configuration.
ID	Data point identifier (must be unique for each device). Note: Device ID nomenclature format must be reviewed by ODOT prior to acceptance to ensure the format does not conflict with device ID's for speed sensors already registered with ODOT's traffic information system.
Road Name	Name of the road where the data point is located.
Road Direction	Direction of the road where the data point is located.
Latitude	Latitudinal location of the data point. Should be based on WGS84 datum.
Longitude	Longitudinal location of the data point. Should be based on WGS84 datum.
Milepost	Milepost location of the data point.
Speed Data	

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Data field	Description
Date	Date on which the speed data for the data point was generated.
Time	Time at which the speed data for the data point was generated.
Device ID	Identifier of the device from which the speed data originated. This ID should reference a device / data point that exists in the last Device Configuration Data that was received
Status	Status indicator of the speed data point. This field can be used by the Proposer to indicate the reporting status of the device/data point. If the device is reporting successfully the value should always be the text 'OK'. Any other value is assumed to be an error related to the device/data point and the Proposer may use this field to communicate specific status information. The possible values of which should be reviewed and approved by ODOT.
Confidence	Confidence value representing the quality/confidence of the speed which is being reported on the roadway. This is a numerical field with whole with only whole integer values. The provider must provide a detailed breakdown of the quality which each confidence value represents or descriptions of the ranges of values. For instance, the provider must specify which confidence value(s) represent no real-time measurements were taken and the speed being reported is based on historical measurements only.
Speed	Traffic speed (in mph) as reported by the device/data point.

(PROPOSER IN-LINE RESPONSE REQUIRED)

XML Data Structure: The following XML data structures are strongly preferred by ODOT for receiving and processing device and real-time speed data from the Proposer. Any deviations to this structure by a Proposer from the XML structure shown below must be reviewed and approved by ODOT Division of IT prior to acceptance.

Proposers indicating an alternative data structure must outline in detail the proposed structure, but also should indicate if they are able to comply with the provided XML structure below should their alternative structure be rejected by the Department.

(PROPOSER IN-LINE RESPONSE REQUIRED)

Device Configuration Data Feed XML Structure

```
<DeviceConfig>
    <DateTimeStamp>
      <Date></Date>
      <Time></Time>
    </DateTimeStamp>
    <DeviceDescription>
      <ID></ID>
      <RoadName></RoadName>
      <RoadDir></RoadDir>
      <Latitude></Latitude>
```

```
    <Longitude></Longitude>
    <MilePost></MilePost>
  </DeviceDescription>
  <DeviceDescription>
    <ID></ID>
    <RoadName></RoadName>
    <RoadDir></RoadDir>
    <Latitude></Latitude>
    <Longitude></Longitude>
    <MilePost></MilePost>
  </DeviceDescription>
  <DeviceDescription>
    <ID></ID>
    <RoadName></RoadName>
    <RoadDir></RoadDir>
    <Latitude></Latitude>
    <Longitude></Longitude>
    <MilePost></MilePost>
  </DeviceDescription>


</DeviceConfig>
```

Speed Data Feed XML Structure

```
<SpeedData>
  <DeviceData>
    <DateTimeStamp>
     <Date></Date>
     <Time></Time>
    </DateTimeStamp>
    <DeviceID></DeviceID>
    <Status></Status>
    <Speed></Speed>
  </DeviceData>
  <DeviceData>
    <DateTimeStamp>
     <Date></Date>
      <Time></Time
          >
    </DateTimeStamp>
    <DeviceID></DeviceID>
    <Status></Status>
    <Speed></Speed>
  </DeviceData>
  <DeviceData>
    <DateTimeStamp>
    <Date></Date>
     <Time></Time
          >
    </DateTimeStamp>
    <DeviceID></DeviceID>
    <Status></Status>
    <Speed></Speed>
```

```
    </DeviceData>
      .
      .
      .
</SpeedData>
```

(PROPOSER IN-LINE RESPONSE REQUIRED)

4.3 : Data Update Rate

Real-time data must be updated and provided at a maximum interval of 1 minute between 5am and 9pm. Real-time data must be updated and provided at a maximum interval of 3 minutes between 9pm and 5am. A data point shall be considered "stale" if ODOT does not receive the data within 5 minutes of the time it was measured. "Stale" data shall be considered unavailable data and subject to data availability requirements in section 4.4. Regardless of if the data is "stale", all data must be reported every one minute. If data is unavailable, a price deduction will occur.

(PROPOSER IN-LINE RESPONSE REQUIRED)

See Section 5 for more information on pricing deductions for data availability.

4.4 : Data Availability

The data feed must be continuously available 24 hours per day, seven days a week. The data feed must be available for a minimum of 99 percent of the time for a billing period. In a given day, at least 97 percent of data must be provided.

(PROPOSER IN-LINE RESPONSE REQUIRED)

The data for each data point must be available for a minimum of 97 percent of a billing period or the Proposer's payment will be reduced accordingly (see Section 5.1 below). The percentage of availability will apply to all data items and for all the data update time periods. If data is not refreshed per minute, it will be treated as if no data was available for that minute, and a data availability deduction may be made.

(PROPOSER IN-LINE RESPONSE REQUIRED)

The Proposer must self-report when data availability falls below the allowable limits. Scheduled downtime for updates must be scheduled at least 48 hours in advance. Scheduled downtime should only occur between the hours of 10PM and 5AM EST. Scheduled downtime must be factored into total downtime for the billing period.

(PROPOSER IN-LINE RESPONSE REQUIRED)

See Section 6.1 for more information on pricing deductions for data availability.

4.5 : Data Accuracy

An accuracy of plus or minus 4 mph or more accurate, based upon 75% of ODOT-collected samples, will be required for the real-time data regardless of time of day. ODOT will perform routine, unannounced random data inspections using the methods described in Section 4.6. If determined that speed data is clearly inaccurate (for example: based on

video footage from existing ODOT ITS cameras for any period of time) ODOT may determine the data to be unavailable for the period of time in which the data is inaccurate, and it shall be subject to requirements for data availability in section 5.4.

(PROPOSER IN-LINE RESPONSE REQUIRED)

In addition, data confidence shall be taken into account for data accuracy on real-time data routes as described in Section 1.1 for Part 1 and Part 2. The reported data confidence values shall indicate accurate speed measurements are being reported for a minimum of 90% of the time during daytime hours from 5AM to 10PM EST and a minimum of 70% of the time during nighttime hours from 10PM to 5AM EST. If real-time data accuracy falls below the minimum thresholds it shall be subject to requirements for data availability in section 4.4.

Failure to meet the minimum data accuracy requirements may result in ODOT finding the Proposer in breach of contract.

(PROPOSER IN-LINE RESPONSE REQUIRED)

4.6 : Data Verification

ODOT will perform routine, unannounced random data inspections.

The real-time data availability and accuracy will be checked by ODOT using procedures developed specifically for this project. Data collected will be compared to the data provided by the Proposer. If determined that speed data is inaccurate, ODOT may determine the data to be unavailable for the period of time in which the data is inaccurate and shall be subject to requirements for data availability in section 4.4 above. If the accuracy or availability of the real-time data provided by the Proposer repeatedly fails to match the data collected by ODOT, the Proposer may be found in breach of contract by ODOT.

(PROPOSER IN-LINE RESPONSE REQUIRED)

Sample historical data must be available to ODOT for testing if requested within 5 business days prior to award of contract. The historical data availability and accuracy will be checked by ODOT using procedures developed specifically for this project. Historical data collected will be compared to the historical data provided by the Proposer. If determined that speed data is inaccurate, ODOT may determine the historical data to be unavailable for the period of time in which the data is inaccurate and shall be subject to requirements for data availability in section 4.4 above. If the accuracy or availability of the historical data provided by the Proposer repeatedly fails to match the data collected by ODOT, the Proposer may be found in breach of contract by ODOT.

(PROPOSER IN-LINE RESPONSE REQUIRED)

4.7: Data Transfer

ODOT will access all real-time data directly from the Proposer's supplied server. ODOT must be provided with all passwords or authorizations required to access the real-time data at any time.

(PROPOSER IN-LINE RESPONSE REQUIRED)

Server maintenance may be performed for one period of up to 3 hours duration between 10PM and 5AM EST on a weekend night only once in any month. When Proposer server maintenance is scheduled, ODOT must be notified at least 48 hours in advance of the maintenance. ODOT reserves the right to require the maintenance to be rescheduled, if needed. Any server maintenance performed inconsistent with the pre-approved server maintenance timeframe may result in a data availability payment deduction. The deduction will only occur if data availability falls below 99 percent for a billing period as stated in Section 4.4. For more information on data availability pricing see Section 5.1 below.

(PROPOSER IN-LINE RESPONSE REQUIRED)

4.8: Use of Data

ODOT reserves the right to use the Proposer real-time speed data in real time for transportation purposes, including operation of Freeway Management Systems, OHGO, BuckeyeTraffic.org, and the Ohio 511 system. ODOT may distribute the Proposer data to the third party Proposer responsible for maintaining the Ohio 511 system. The Ohio 511 Proposer shall be prohibited from using or distributing the data for any other (non-ODOT 511) purpose. ODOT also reserves the right to distribute offline/archived speed data from the ODOT database to other public agencies and universities, including those within the Commonwealth of Kentucky.

(PROPOSER IN-LINE RESPONSE REQUIRED)

The Proposer may sell or otherwise provide the real-time speed data provided through this agreement to any other public or private entity.

(PROPOSER IN-LINE RESPONSE REQUIRED)

ODOT shall be able to use historical data for any internal purpose without restriction.

(PROPOSER IN-LINE RESPONSE REQUIRED)

ODOT shall also be able to share historical data along with any provided analytics tools with any public entity in the State of Ohio at no additional cost to the Department or other public entity.

(PROPOSER IN-LINE RESPONSE REQUIRED)

4.9: Location-Restrictions of Data

This contract is subject to Ohio Executive Order 2011-12K which bans the expenditure of public funding for off-shore services. The Proposer must fully comply with this Executive Order in the performance of all services related to this contract. "Services" shall include data which must also reside in the United States. Failure to comply with the above requirements will be considered a material breach of contract and could lead to an immediate cancellation of any resulting contract. Notwithstanding any other terms of this Contract, ODOT reserves the right to recover any funds paid for services the Proposer performs outside of the United States

(PROPOSER IN-LINE RESPONSE REQUIRED)

The Proposer should complete and return the Standard Affirmation and Disclosure Form located on the following website in their submitted proposal package:

http://procure.ohio.gov/pdf/EO201112K/EO201112K_Announcement.pdf

4.10: Installation of Devices

This Section only applies if physical devices are required to collect speed data.

ODOT will provide guidance for data point locations. The Proposer may advise ODOT on the location of devices, but ODOT will make the final decision on device location. The Proposer is responsible for all device installations.

(PROPOSER IN-LINE RESPONSE REQUIRED)

Due to construction in any of the regions across the state, any devices installed cannot require land-line utility power, land-line communications or any other hardwired infrastructure. Any utilities needed for a device must be wireless. The devices may be placed on existing infrastructure approved by ODOT, but the Proposer will be responsible for providing any services to the devices. No devices will be mounted on bridges. If no appropriate infrastructure is in place for mounting Proposer's devices, the Proposer is responsible for providing the necessary infrastructure. Each ODOT District will issue a blanket permit for devices located within the right of way provided the Proposer meets all ODOT permit requirements. The devices must be portable in the event that relocation is needed. It is the Proposer's responsibility to acquire the necessary permits, including the Right-of- Way (ROW) Use Permits. Upon conclusion or termination of the contract, the Proposer must remove all installed devices.

(PROPOSER IN-LINE RESPONSE REQUIRED)

If any devices are to be mounted on poles or other non-permanent installations, the Proposer must meet all ODOT requirements and specifications. The Proposer must also provide any Maintenance of Traffic (MOT) needed for the installations of devices. While performing MOT, all ODOT requirements and specifications must be met. The Proposer must specifically comply with Section 107 of the most current version of ODOT Construction and Material Specifications.

(PROPOSER IN-LINE RESPONSE REQUIRED)

Throughout the duration of the contract, ODOT reserves the right to require the Proposer to relocate any device as necessary due to construction or other events. ODOT will require the Proposer to relocate the device(s) within five (5) calendar days of written notification. If the Proposer decides to move a device from the originally agreed-upon location, ODOT must be contacted within at least five (5) calendar days of the change, and the new location must be pre-approved by ODOT in writing before any changes are implemented. As stated previously, the Proposer will advise ODOT on device locations, but ODOT will make the final decision on device location. The costs for relocated devices will be incidental to the cost of the data. Whenever a device is relocated, the Proposer must provide an updated spreadsheet of device location information.

(PROPOSER IN-LINE RESPONSE REQUIRED)

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MOT requirements must also be followed during installation and maintenance of the devices.

(PROPOSER IN-LINE RESPONSE REQUIRED)

Upon either expiration or termination of the contract, the Proposer must remove all installed devices within three (3) months. The Proposer shall obtain appropriate ODOT Right-of-Way (ROW) Use Permits when removing any installed devices.

(PROPOSER IN-LINE RESPONSE REQUIRED)

Section 5: Pricing, Invoicing and Payment

Pricing for real-time data shall be per the contract bid price per month, regardless of the number of sensors installed, if any. The price for real-time data for any data point must include all overhead, devices, labor, equipment, materials and any incidentals necessary to establish pricing to meet or exceed the bid requirements.

(PROPOSER IN-LINE RESPONSE REQUIRED)

Pricing for historical data shall be per the contract bid price for all data.

(PROPOSER IN-LINE RESPONSE REQUIRED)

Invoicing for real-time and/or historical data must be monthly and must be submitted at the end of the month. Payment for real-time data will begin when data is available for one full monthly billing period. As required under Section 4.4, data for all data points is required continuously. If for any reason data is not reported for a time period and/or data point, the monthly billing must deduct the amount commensurate with the mileage and time during which data was not provided.

(PROPOSER IN-LINE RESPONSE REQUIRED)

5.1 : Pricing Deduction for Availability

The data feed must be continuously available 24 hours per day, seven days a week. If the data feed is available at least 99 percent of the time for a given billing month, full payment will be made. If data is not available at least 99 percent of the time, a deduction to the monthly billing will be made by taking the percent of time the data feed was unavailable from the monthly price.

(PROPOSER IN-LINE RESPONSE REQUIRED)

The data for each data point must be available for a minimum of 97 percent of a billing period. If data availability drops below 97 percent for a given data point for a month, the Proposer will not be paid for that data point for the entire month. This will be applied to all data points that fall below the 97 percent availability.

(PROPOSER IN-LINE RESPONSE REQUIRED)

If a single data point is unavailable for 5 consecutive days in a month, a new data point must be established. The Proposer will have 5 calendar days from the 1st day of unavailability to establish a new data point. The new data point must be established at no additional cost to ODOT. If the new data point is not established within the given timeframe, ODOT may find the Proposer in material breach of contract.

For more information on data availability see Section 4.4.

(PROPOSER IN-LINE RESPONSE REQUIRED)

5.2 : System Updates

The Proposer must use the newest version of software, firmware, system, services or methods available when providing data to ODOT. Any updates or revisions will be at no additional cost to ODOT. System updates shall be subject to scheduled downtime and data availability requirements as specified in Section 4.4.

(PROPOSER IN-LINE RESPONSE REQUIRED)

Section 6: Proof of Concept

A Proof of Concept (Solution) demonstration will be performed by the successful Proposer for each Part or Parts awarded to the Proposer through this RFP. The proof of concept will provide an opportunity to demonstrate the Proposer can successfully send data to ODOT via the specified XML data format.

(PROPOSER IN-LINE RESPONSE REQUIRED)

The goals of the Proof of Concept shall be to evaluate technical capabilities of the Proposer's data services to ensure all RFP requirements are met and to demonstrate how the speed data service solution meets ODOT's business needs.

The timeline for the proof of concept may have a duration of up to several weeks. At the conclusion of the proof of concept phase, ODOT will conduct a final evaluation of the Proposer's technical capabilities and proposed solution and make a determination on whether or not to move forward in implementing the Proposer's solution. The Department shall reserve the right terminate the executed agreement with the Proposer if in the opinion of the Department the Proposer's solution does not fit the Department's needs and/or the Proposer's solution does not conform to the requirements of this RFP or their provided in-line responses. In the event the Department wishes to cancel the agreement, the Proposer shall be entitled to receive only five percent (5%) of the annual total cost for the Part or Parts awarded to the Proposer.

(PROPOSER IN-LINE RESPONSE REQUIRED)

In the event an agreement is cancelled by the Department as a result of the proof of concept phase, ODOT shall retain and own any data collected by the Proposer as well as any documentation completed by the Proposer pertaining to this ODOT project. ODOT may then move on to begin negotiations with the next highest scoring Proposer.

(PROPOSER IN-LINE RESPONSE REQUIRED)

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2. PROPOSAL RESPONSE REQUIREMENTS

Purpose

The purpose of these Proposal Response Requirements is to describe how proposals shall be constructed, delivered, evaluated, scored, and awarded. This section also serves to provide information on how to submit pre-proposal questions/inquiries and how changes to this RFP will be made.

Section 1: Proposal Inquiries

Any discrepancies, omissions, ambiguities, or conflicts in or among these proposal documents or doubts as to the meaning shall be brought to the Department's attention by the Proposer not later than seven (7) business days prior to the submission deadline. All questions, discrepancies, clarifications, etc. must be submitted electronically (hyperlink below). Bidders are prohibited from contacting any ODOT office, including District offices, other than the Office of Contract Sales, Purchasing Services section to obtain responses to any questions. The Department may find a bidder non-responsive for failing to adhere to any of the above requirements.

Pre-bid questions/inquiries must be submitted electronically through the following website:

http://www.dot.Department.oh.us/Divisions/ContractAdmin/Contracts/Pages/PurchasePBQ.aspx

Answers to Pre-Bid Questions/Inquiries will be posted on the following document available for download at the following website:

http://www.dot.Department.oh.us/Divisions/ContractAdmin/Contracts/Purchase/PBQ-Answers.doc

It is the bidder's responsibility to check the website for updates to pre-bid questions and answers before submitting its bid to the Department.

Questions and inquiries must be submitted by no later than **2:00 p.m. on Tuesday, May 3rd.** There is no deadline for administrative questions.

1.1 Changes and Amendments

The Department will only make changes to this RFP by way of written addendum. All issued addenda will be posted for viewing at the following website:

http://www.dot.state.oh.us/Divisions/ContractAdmin/Contracts/Lists/PurchaseUpcomingITBs/RFP.aspx

Proposers must acknowledge all issued addenda in their submitted Proposal response.

Section 2: Proposal Organization Requirements

Both original and copies of complete Proposal responses should be compiled and bound in an organized manner separating each of the major components of this RFP through the use of properly labeled tabs.

A complete Proposal response should include, at a minimum, the following items:

(a) An original signed, Proposal cover letter should be included with the Proposal submittal. The cover letter should state the purpose of the submittal and which Speed Data Service Parts (i.e. Part 1, Part 2, and Part 3) the company is submitting consideration for and be an original signature by a representative of the offering organization authorized to bind the Proposer, including the representative's title, address, and telephone number.

(b) Completed Signature Page with an original signature by a representative of the offering organization authorized to bind the Proposer.

(c) A hard copy of all issued addenda.

(d) A description of the Proposer's organization, including a summary of previous experience which qualifies the Proposer to successfully deliver the services described in this document. Include specific details of related experience, such as dates of work or assignment, names and addresses of other customers, or other details that appropriately support the Proposer's ability and experience to deliver the proposed services.

(e) A list of the key individuals from the Proposer's organization who will be involved in delivering the Proposer's services. For each individual, include his/her role, responsibilities, contact information and a brief résumé of experience.

(f) A detailed summary of how the Proposer plans to meet or exceed on all data requirements included in this RFP. This should be included, at a minimum, in the Proposer's provided in-line responses to the technical requirements as required below in Section 2.1.

(g) Completed Standard Affirmation and Disclosure Form.

(h) The required number of copies (both paper and electronic) of the Proposer's complete Proposal response.

(i) Proposal response must include completed paper and electronic copies of the following Excel Cost Proposal file:

http://www.dot.state.oh.us/Divisions/ContractAdmin/Contracts/PurchDocs/521apricing.xls

(j) A completed and signed Proposer Certification Form

Failure to comply with and return Items A-J above may result in a non-responsive proposal determination.

2.1 In-Line Responses to Speed Data Service Technical Requirements

These instructions describe the required format for responding to each of the Department's technical requirements located in *1. Speed Data Service Requirements*. Proposers should use the Microsoft Word version (link to word document below) of this RFP so as the Proposer can provide required in-line responses to each of the requirements of this RFP.

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ftp://ftp.dot.state.oh.us/pub/Contracts/Purchase/521A-16/

The Department has noted in red in *Volume 3: Speed Data Service Requirements* where it wants a detailed in-line response to be provided by the Proposer demonstrating how they plan to meet the requirements outlined in said sub-section. The Department's requirement for Proposer in-line responses is indicated by the following:

(PROPOSER IN-LINE RESPONSE REQUIRED)

Proposer should use a consistent contrasting font color (red is highly suggested so as to contrast with the black text of this document) to provide their response to each technical requirement so that the proposer's response is evidently distinguishable to the baseline content of the RFP. Each Proposal must include a response to every inserted request for an in-line response to be provided whether the request requires a simple "Yes" or "No" or requires a detailed explanation. Simply repeating the RFP's requirements and agreeing to comply may be considered an unacceptable response by the Department.

To aid proposers in the creation of the most favorable depiction of their responses, alternative formats are acceptable that use typefaces, styles or shaded backgrounds, so long as the use of these formats are consistent throughout the proposers response and readily evident from the Department's written requirements in this RFP.

Alterations to the provided baseline RFP language is strictly prohibited. The Department will electronically compare proposer responses to the baseline RFP and deviations or alterations to the Department's RFP requirements may result in a rejection of the proposer's Proposal. To ensure that each Proposal addresses the required sections of the RFP, proposers must address each RFP requirement by section and sub-section heading and provide the proposer's proposed solution or response to the requirement by section and subsection in-line using the provided Microsoft Word version of this RFP.

PLEASE NOTE: Proposers will not be penalized for leaving a required in-line response blank if the in-line response being requested does not pertain to the Speed Data Service Part (i.e. Part 1, Part 2, and Part 3) the Proposer is submitting their Proposal in consideration of. Example: A Proposer submitting a Proposal to provide Historical Speed Data (i.e. Part 3) only does not need to address in-line responses pertinent to exclusively Part 1 and/or 2.

Section 3: Proposal Copies (paper and electronic)

Proposers should include the following copies of their complete proposal response in their submitted proposal package:

a. One (1) Original Hard Copy Proposal Response and completed Excel cost proposal containing all required information and forms containing original signatures and (Must be marked as an Original on the cover page)

b. Five (5) Hard Copies of your entire Proposal response excluding your Excel cost proposal.
(Each must be marked as a Copy on the cover page)

c. One (1) Electronic (.PDF) Copy of Entire Proposal response including the Excel Cost Proposal (can be .pdf as well)
(Must be included on CD/DVD or flash drive)

d. One (1) Electronic (.PDF), Proposer Redacted Copy of Entire Proposal with Excel cost proposal. (Must be included on CD/DVD or flash drive with file name specifically indicating the file is the "Redacted" version)**

**Items contained within a Proposal in which a Proposer considers a trade secret, proprietary, or confidential must be marked as such through the process of redaction. This electronic, redacted copy of the Proposal will be provided in response to public record requests made by interested parties. Proposers who mark substantial portions of their proposal as confidential or proprietary may be considered non-responsive and ineligible for award of this RFP.

Failure to comply with items A through D above may result in a non-responsive proposal determination. Non-responsive proposals will not be evaluated by the Department.

Section 4: Proposal Delivery

Complete Proposal packages in response to this Request for Proposal must be received at the following address on or before **2:00 pm eastern time on, Tuesday, May 10, 2016** at the following location:

Ohio Department of Transportation
Office of Contract Sales, Purchasing Services
1980 W. Broad Street, 1st floor, Mail Stop 4110
Columbus, OH 43223
Office Hours 7:00 a.m. to 4:00 p.m., M-F (excluding State holidays)

No proposals will be accepted after the time specified. No facsimile transmissions will be accepted. ODOT reserves the right to reject any and all proposals.

Timely receipt of proposals will be determined by the date and time the proposal is received at the address specified. Receipt of proposals in the ODOT Mail Room or any other ODOT office shall not be considered timely. Hand delivery is strongly encouraged to ensure timely receipt. Proposals received after the deadline will be stamped for time and date and will be kept in the Department's contract file for this RFP.

All materials submitted in accordance with this solicitation become the property of the State of Ohio and shall not be returned. All materials submitted in accordance with this solicitation shall remain confidential until the Proposer is selected at which time all submitted information becomes a part of the public record.

Proposals must be packaged in such a manner that the outer wrapping clearly indicates the following information:

Request for Proposal #521A-16
Speed Data Services
Submission Deadline: (insert date)
Proposer Name

3. Proposal Evaluation and Contract Award

Proposal Evaluation begins when proposals are opened by Office of Contract Sales, Purchasing Services section and the section has verified compliance for formatting and completeness as outlined in the *Proposal Response Requirements*. During the initial evaluation process, in the Office of Contract's may, in its sole discretion, request clarifications from any Proposer and may give any Proposer the opportunity to correct defects in its Proposal, if the ODOT believes doing so would not result in an unfair advantage for the Proposer, and it is in the ODOT's interest.

ODOT may reject any Proposal that is not in the required format, does not address all the requirements of this RFP, objects to any of the terms or conditions of this RFP, or that the ODOT determines is excessive in price or otherwise not in the ODOT's best interest to accept.

After the initial evaluation process, the Office of Contract Sales will then provide the Review Panel with all responsive Proposals to be evaluated and scored. The Review Panel consists of ODOT employees from the Division of Operations, Division of Information Technology and a representative of the Office of Contract Sales, Purchasing Services section.

1.1: Proposal Evaluation and Scoring

The Department utilizes consensus, team scoring in evaluating and ranking Proposals. The following evaluation and scoring criteria will be used by the Review Panel to evaluate and score Proposals by individual Part (three total Parts):

- **Organizational Structure / Project Experience (200 max points available)**
  - Proposer's staffing configurations and their intended support model.
  - Proposer must identify key staff members who will be dedicated to managing the functions of this project from implementation to post-implementation support.
  - Proposer's detailed resumes for each key staff member.
  - Experience of the Company providing speed data services of a similar nature
  - Proposer's history of delivering similar data services.
  - Proposer's detailed, specific project experience with contact information for all projects and references given.
- **Data Service and Support (300 max points available)**
  - Proposer's In-Line responses cover in detail how the Proposer plans to provide speed data services meeting or exceeding the speed data services requirements outlined by Part throughout this RFP.
- **Number of Data Points (200 Max points available)**
  - The number of data points bid meets the minimum data points requirement
  - Quantity, quality, and value of additional data points, if offered.
  - Proposers offering a greater number of data points required may receive additional consideration for this section.
  - Proposer's detailed methodology being used to provide more granular data

- **Cost Proposal (250 max points available)**
  - Cost Proposal is reasonable and consistent with the value and quality of data services being offered. Cost Proposals deemed, in the opinion of the Department, to be excessive based on the services offered will not be evaluated.
  - Proposers are required to utilize the following Excel file to submit Cost Proposals:**http://www.dot.state.oh.us/Divisions/ContractAdmin/Contracts/PurchDocs/521apricing.xls**
  - See Section 1.2 below for how points will be allocated for Cost Proposals.

- **Exceptions (50 max points available)**
  - Proposer submitted no exceptions or amendments to the contract's Supplemental terms and conditions or Proof of Concept phases' associated terms and conditions.
  - This section shall be evaluated on an "all or nothing" basis meaning Proposers will either receive all available points for this section or zero points for this section. Proposers submitting no exceptions will receive all 50 points, while Proposers submitting exceptions or amendments will receive zero points for this evaluation criteria.

Excluding the **Exceptions** and **Cost Proposal** evaluation criteria, the evaluation and scoring sections above will receive a 0 through 5 score from the Review Panel. The key below indicates how points will be awarded based on the Review Panel's score and how the Department will assign points based on the score and weights below:

Score	Weight**	Description
0	**0%**	**Does Not Meet**- Proposer either did not respond at all to requirements or barely provided enough information to evaluate requirements
1	**20%**	**Minimally Meets**- Proposer provided some information but did not address most items adequately
2	**40%**	**Less than Meets**- Proposer provided almost all of the details required and attempted to respond to each item
3	**60%**	**Meets**- Proposer has met the minimum and general requirements.
4	**80%**	**Exceeds**- Proposer exceeds the minimum requirements
5	**100%**	**Greatly Exceeds**- Proposer greatly exceeds the minimum requirements

**The percent weight indicates the percent of maximum available points a Proposer will receive based on the score assigned for a particular scoring and evaluation criteria.

Weighting Example: Project Experience has a 200 point award maximum. A Proposer receiving a consensus score of '3' (Meets) for Project Experience will receive 60% of the 200 point maximum (or 120 points) based on the chart provided above. A Proposer receiving a '5' (Greatly Exceeds) would receive 100% of the available points (200 available points).

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ODOT may require some Proposers to interview, make a presentation about their Proposals, or demonstrate their products or services. If the presentations, demonstrations, or interviews are held as part of the technical evaluation phase, all Proposers that have Proposals under evaluation may participate. Alternatively, if the presentations, demonstrations, or interviews are held after the technical evaluation, ODOT normally will limit them to one or more of the highest ranking Proposers. ODOT normally will limit such presentations, demonstrations, and interviews to areas in which it seeks further information from the highest ranking Proposer(s).

1.2: Cost Proposal Evaluation, Scoring, and Contract Award

Proposers are required to complete and submit the following Excel Cost Proposal file in their Proposal response:

http://www.dot.state.oh.us/Divisions/ContractAdmin/Contracts/PurchDocs/521apricing.xls

Once the technical merits of the Proposals are evaluated and scored, the Office of Contracts representative will then distribute costs proposals to the Review Panel. It is within the ODOT's discretion to wait until after any interviews, presentations, and demonstrations to evaluate costs. Also, before evaluating the technical merits of the Proposals, the ODOT Office of Contracts may do an initial review of costs to determine if any Proposals should be rejected because of excessive cost. The ODOT may reconsider the excessiveness (or appearance of excessiveness) of any Proposal's cost at any time in the evaluation process if the Proposal provides, in the Department's opinion, substantially more value than the minimum requirements.

For both Parts 1 and 2, the Department will evaluate cost proposals based on the Proposer's submitted cost(s) per month for each bid item.

For Part 3, the Department will evaluate and score cost proposals based on the cost per month submitted for the number of centerline miles bid.

Cost Proposal Points Calculation for both Part #1 and Part #2 =
(Lowest Cost Per Month Submitted/Cost Per Per Month being evaluated) x 250 points

Cost Proposal Points Calculation for Part #3 =
(Lowest Cost Per Month Submitted/Cost Per Month being evaluated) x 250 points

EXAMPLE COST PROPOSAL CALCULATION #1:
Part 1 - Coverage, Real-Time Speed Data
(Note: this example assumes no Proposers submitted for all three (3) Parts and no percent discount exists)
Proposer A: $1,000 per month
Proposer B: $1,200 per month
Proposer C: $1,400 per month

Proposer A- Receives all 250 points for Part #1
($1,000 (Proposer A)/$1,200 (Proposer B) x 250 points= **Proposer B- Receives 208 points for Part #1**
($1,000 (Proposer A)/$1,400 (Proposer C) x 250 points= **Proposer C- Receives 179 points for Part #1**

EXAMPLE COST PROPOSAL CALCULATION #2:
(Note: this example assumes Proposer B submitted a cost proposal for all three (3) Parts AND provided a percent discount)
Part 1 - Coverage, Real-Time Speed Data

Proposer A: $1,000 per month
Proposer B: $1,200 per month

Proposer C: $1,400 per month

Using the same cost information from example #1 above, now assume Proposer B submitted a cost proposal for all three (3) Parts AND submits a percentage discount of 10% for Part 1. Proposer B's cost per data point, per month would be adjusted to $5.40 ($6.00 x .10= $0.60) for Part #1.

Proposer B- Receives all 250 points for Part 1
($5.40 (Proposer B)/$5.75 (Proposer A) x 250 points= **Proposer A- Receives 235 points for Part 1**
($5.40 (Proposer B)/$9.00 (Proposer C) x 250 points= **Proposer C- Receives 150 points for Part 1**

For Bid Items 1A and 2A, Proposer must bid their lowest and best price to provide the total minimum number of data points shown in Appendix A on a route-by-route basis.

For optional Bid Items 1B and 2B, Proposer may provide a monthly cost based on an increased number of data points for the same routes and should indicate the total number of proposed data points to be provided. For items 1B and 2B, the actual data points indicated by the proposer on the Excel bid sheet should include all minimum data points shown in Appendix A plus the additional data points the proposer can provide.

For Part 1, the Department may award based on either Bid Item 1A or 1B, whichever is determined by the Department to provide the best value.

For Part 2, the Department may award based on either Bid Item 2A or 2B, whichever is determined by the Department to provide the best value.

The Department reserves the right to award this contract either by individual Part or instead to the highest scoring Proposer able to successfully perform speed data services for all three (3) Parts of this RFP.

The Department has provided an optional cost proposal item allowing for Proposers to submit a discount factor by Part, offered to the Department, should they be awarded all three (3) Speed Data Service Parts to be awarded through this RFP. In the event a Proposer submits a discount factor off of EACH Part, the Department reserves the right to adjust the Proposer's submitted cost per month per Part (including any costs submitted for 1B and 2B) based on the percent discounts offered. The adjusted costs for Parts 1, 2, and 3 will then be used by the Department to evaluate and score the Proposer's cost proposal by Part. The Proposer must submit a percent discount for EACH Part in order to receive additional consideration (by way of additional cost proposal points). The Discount factor submitted must apply to both bid items, where applicable. The discount factor will be applied to the bid item by Part chosen for award by the Department.

1.3: Contract Formation

The Contract shall be formed between the Department and the winning Proposer(s) when the Department executes the Proposer's signed Signature Page and provides the winning Proposer(s) a State of Ohio Purchase Order initiating the Proof of Concept phase and project commencement. The Purchase Order will amount to five (5%) percent of the total annual cost for all Parts awarded to the Proposer. Upon what ODOT determines to be a successful completion of the Proof of Concept phase, the Department will modify the Purchase Order with the remaining funds needed for that year's services.

1.4: Contract Duration

The effective duration of any resulting contract will be from the **Date of Contract Formation** through **July 31, 2018**. This contract may be renewed, at the option of the

Department, for up to one (1) calendar year period beyond the original contract expiration date.

The Department reserves the right to cancel, without damage to the Department, any resulting contract with a Proposer who has, in the opinion of the Department, failed the proof of concept phase. The Department's cancellation of any resulting contract will be done so in writing and effective immediately upon the Proposer's receipt. The Department may then begin contract negotiations with the 2nd highest scoring Proposer.

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4. TERMS AND CONDITIONS FOR BIDDING

A. All expenses incurred by Responding Proposer in responding to this RFP shall be borne by the Responding Proposer. In no event shall ODOT be responsible for any such expenses.

B. All changes or amendments to the specifications and requirements of this RFP will be made via written addendum only.

C. In order to protect the integrity of the RFP process, proposals shall not be prepared, completed or altered on ODOT premises. Any proposal which is prepared, completed or altered on ODOT premises may be disqualified.

D. ODOT will seek to open the Proposals in a manner that avoids disclosing their contents. Additionally, the ODOT will seek to keep the contents of all Proposals confidential until a Contract is awarded. ODOT will prepare a registry of Proposals that contains the name of each Proposer. The public may inspect that registry after ODOT opens the Proposals.

E. ODOT is exempt from federal excise taxes and all state and local taxes. Responding Proposer shall not charge or withhold any taxes on commodities, goods, or services provided to ODOT.

F. ODOT may cancel this RFP, reject all the Proposals, and seek to do the Work through a new RFP or other available means.

G. Any of the following reasons may be considered sufficient for rejection of a proposal:

1. Responding Proposer or any subsidiary or related company submits more than one proposal for the same RFP under the same or different name.
2. Responding Proposer colludes in any manner in responding to this RFP.

ODOT will not award a contract for goods or services to a Responding Proposer who has been suspended or debarred from doing business with the State of Ohio or who appears on the Federal List of Excluded Parties Listing System.

H. ODOT will not enter into a contract with any Responding Proposer who has provided material assistance to any organization on the United States, Department of State's terrorist exclusion list.

I. ODOT will not enter into a contract with any Responding Proposer who is subject to a finding for recovery under Ohio Revised Code Section 9.24. The successful Responding Proposer will be required to affirm that it is not subject to a finding for recovery prior to executing a contract pursuant to this RFP.

J. Responding Proposer may be disqualified from consideration if, as applicable to it, any party listed in Division (I) or (J) of Section 3517.13 of the Revised Code or spouse of such party has made, as an individual, within the two previous calendar years, one or more contributions totaling in excess of $1,000.00 to the Governor or to his campaign committees.

K. Responding Proposer shall comply with all applicable state and federal laws regarding drug-free workplace. The Responding Proposer shall make a good faith effort to ensure that its employees, while working on state property, will not purchase, transfer, use or possess illegal drugs or alcohol or abuse prescription drugs in any way.

L. Responding Proposer shall not discriminate against any employee or applicant for employment because of race, religion, color, sex, national origin, disability, sexual orientation, gender identity, genetic information or age. Responding Proposer will ensure that applicants are hired and that employees are treated during employment without regard to their race, religion, color, sex, national origin, disability, sexual orientation, gender identity, genetic information or age. Such action shall include, but not be limited to, the following: Employment, Upgrading, Demotion, or Transfer; Recruitment or Recruitment Advertising; Layoff or Termination; Rates of Pay or other forms of Compensation; and Selection for Training including Apprenticeship.

M. Responding Proposer shall post in conspicuous places, available to employees and applicants for employment, notices setting forth the provisions of this nondiscrimination clause. Responding Proposer will, in all solicitations or advertisements for employees placed by or on behalf of Responding Proposer, state that all qualified applicants will receive consideration for employment without regard to race, religion, color, sex, national origin, disability, sexual orientation, gender identity, genetic information or age. Responding Proposer shall incorporate the foregoing requirements of this paragraph in all of its contracts for any of the work prescribed herein (other than subcontracts for standard commercial supplies or raw materials) and will require all of its subcontractors for any part of such work to incorporate such requirements in all subcontracts for such work.

N. Responding Proposer agrees to fully comply with Title VI of the Civil Rights Act of 1964, 42 USC Sec. 2000. Responding Proposer shall not discriminate on the basis of race, color, or national origin in its programs or activities. The Director of Transportation may monitor the Responding Proposer's compliance with Title VI.

O. Responding Proposer shall comply with the requirements of Ohio Ethics law as provided by Section 102.03 and 102.04 of the Ohio Revised Code.

P. Responding Proposer shall maintain all records and files generated as a result of this RFP. All records are to be considered the property of ODOT and shall be made available to ODOT staff on or off of Responding Proposer's premises for review and audit. Upon completion of the contract, the Responding Proposer shall deliver all records and files to ODOT in a format to be determined by ODOT (allowing for electronic vs. paper) or otherwise shall dispose of them as directed by ODOT.

Q. Responding Proposer shall permit ODOT or its designee access to all original books, records, invoices, and accounting procedures and practices of the Responding Proposer relevant to this RFP. The Responding Proposer's financial records shall be kept in accordance with Generally Accepted Accounting Principles (GAAP). The Responding Proposer shall retain all records for three years after the termination of a contract with ODOT.

R. Responding Proposer shall, when requested, provide the name and version of all financial software, program software, and inventory software to be used by the Responding Proposer for this RFP. The Responding Proposer must also demonstrate sound IT security and data retention policies, and comprehensive data recovery and back up plans to prevent unauthorized access or destruction of data.

S. No person, broker or selling agency shall be employed, retained or given anything of monetary value to solicit or secure this contract, except bona fide employees of ODOT. For breach or violation of this provision, ODOT shall have the right to reject the proposal or annul any resulting contract.

T. Responding Proposer shall clearly mark any information submitted through this RFP process in which the Responding Proposer considers either proprietary or a trade secret. A trade secret is defined in Section 1333.61(D) of the Ohio Revised Code. ODOT shall not be held responsible or liable in any way for a Responding Proposer's failure to follow all instructions regarding trade secrets and proprietary information contained herein. Responding Proposers cannot mark their entire proposal as a trade secret.

U. Submitted Proposal responses (including cost proposal) shall be valid for a minimum of ninety (90) calendar days from the date that proposals are opened by the Office of Contract Sales. Once the contract is awarded, the Proposer shall deliver the services outlined in the RFP. If the Department does not make an award within the ninety (90) calendar day period it will be at the option of the Proposer to rescind their proposal response from award consideration if they so choose. The Department may assess all actual and direct damages against a Proposer who rescinds their Proposal response from award consideration within ninety (90) calendar days from the date proposals are opened by the Office of Contract Sales. In submitting a response to this Request for Proposal, the Proposer agrees that they will enter into a Contract with the Department if selected for award of this RFP.

(the remainder of this page has been left intentionally blank)

5. PROPOSER CERTIFICATION FORM

The Proposer is not currently subject to an "unresolved" finding for recovery under Revised Code Section 9.24, and the Proposer will notify the Procurement Representative any time it becomes subject to such a finding before the award of a Contract arising out of this RFP.

1. The Proposer certifies that it will comply with Executive Order 2011-12K; all services must be performed within the United States. Furthermore, the Proposer will not allow others to perform work for the State of Ohio outside the United States.
2. The Proposer certifies that it will provide a letter stating the location and handling of State data for approval by the ODOT Information Technology Department. Furthermore, the Proposer understands: State data must be maintained in a secure manner; the data must not be used for any purposes other than those required to fulfill the contract; and upon completion of the project the data must be destroyed.
3. The Proposer certifies that its responses to the following statements are true and accurate. The Proposer's answers apply to the last seven years. Please indicate yes or no in each column.

Yes/No	Description
	The Proposer has had a contract terminated for default or cause.
	The Proposer has been assessed any penalties in excess of $10,000.00, including liquidated damages, under any of its existing or past contracts with any organization (including any governmental entity).
	The Proposer was the subject of any governmental action limiting the right of the Proposer to do business with that entity or any other governmental entity.
	Trading in the stock of the company has ever been suspended with the date(s) and explanation(s).
	The Proposer, any officer of the Proposer, or any owner of a 20% interest or greater in the Proposer is currently under litigation or has had a judgment against on any legal claim related to the product or services being offered.
	The Proposer, any officer of the Proposer, or any owner of a 20% interest or greater in the Proposer has filed for bankruptcy, reorganization, a debt arrangement, moratorium, or any proceeding under any bankruptcy or insolvency law, or any dissolution or liquidation proceeding.
	The Proposer, any officer of the Proposer, or any owner with a 20% interest or greater in the Proposer has been convicted of a felony or is currently under indictment on any felony charge.
	The Proposer is an affected party in any current or impending litigation.

If the answer to any item above is affirmative, the Proposer must provide complete details about the matter. While an affirmative answer to any of these items may not automatically disqualify a Proposer from consideration, at the sole discretion of the State, such an answer and a review of the background details may result in a rejection of the Proposal. The State will make this decision based on its determination of the seriousness of the matter, the matter's possible impact on the Proposer's performance under the Contract, and the best interest of the State.

4. The Proposer certifies that neither it nor any of its people that may work on or benefit from the Contract through the Proposer has a possible conflict of interest (e.g., employed by the State of Ohio, etc.) other than the conflicts identified immediately below:

Potential Conflicts (by person or entity affected)

(Attach an additional sheet if more space is need.)

The State may reject a Proposal in which an actual or apparent conflict is disclosed. And the State may cancel or terminate the Contract for cause if it discovers any actual or apparent conflict of interest that the Proposer did not disclose in its Proposal.

5. The Proposer certifies that all its and its subcontractors' personnel provided for the Project will have a valid I-9 form on file with the Proposer or subcontractor, as appropriate, and will have presented valid employment authorization documents, if they are not United States citizens.

Please provide the following information for a contact person who has authority to answer questions regarding the Proposer's Proposal:

Name:	
Title:	
Mailing Address:	
Office Phone Number:	
Cell Phone Number:	
Fax Number:	
Email Address:	

Date:

Signature:

Print Name and Title of Person Signing Above:

Company Name:

6. SUPPLEMENTAL TERMS AND CONDITIONS

SUPPLEMENTAL TERMS AND CONDITIONS

The following supplemental terms and conditions shall be fully incorporated into any Contract resulting from the Department's award of RFP #521A-16:

Entire Contract: The entire Contract (ODOT Contract #521A-16) between the PARTIES shall consist of all specifications, requirements, terms, and conditions included in the Department's RFP #521A-16, the PROPOSER's submitted proposal in response to RFP #521A-16, all written amendments or clarifications to the PROPOSER's original proposal response, Signature Page executed by both PARTIES, and these Supplemental Terms and Conditions. This Contract supersedes all prior agreements (both written and oral) between the PARTIES with respect to the work to be performed. In the event there is a conflict between the documents constituting this entire Contract, these Supplemental Terms and Conditions shall prevail.

Headings: The headings used in this Contract are for convenience only and will not affect the interpretation of any of the Contract terms and conditions.

Non-Appropriation and OBM Certification: Performance by ODOT under this Contract may be dependent upon the appropriation of funds by the Ohio General Assembly. Therefore, in accordance with Section 126.07 of the Ohio Revised Code, it is understood that ODOT's funds are contingent on the availability of such lawful appropriations by the Ohio General Assembly. If the Ohio General Assembly fails at any time to continue funding for the payments due hereunder, this Contract is hereby terminated as of the date that the funding expires without further obligation of ODOT.

Taxes: ODOT is exempt from federal excise taxes and all state and local taxes, unless otherwise provided herein. ODOT does not agree to pay any taxes on commodities, goods, or services acquired from any PROPOSER.

Payment: In consideration for PROPOSER's performance, ODOT shall pay PROPOSER directly at the rates in the PROPOSER'S submitted cost proposal for RFP #521A-16 and in accordance with all billing and payment terms included in RFP# 521A-16. Payments will be made by an Auditor of State warrant on a net 30 basis.

By Purchase Order Upon delivery of goods or performance of the service, as described on any purchase order placed against this contract, PROPOSER shall submit proper invoices, in quadruplicate, directly to the ordering agency billing office as indicated on the purchase order. A proper invoice is defined as being free from defects, discrepancies, errors or other improprieties and shall include, but may not be limited to:

1) PROPOSER's name and address as designated in the Quote.
2) PROPOSER's federal E.I. number.
3) Invoice remittance address as designated in the Quote.
4) The Purchase Order number authorizing the purchase of goods or services.

Description, including time period, unit price, quantity, and total price of goods or services delivered or rendered as specified in the Purchase Order. Defective invoices shall be returned to the PROPOSER noting areas for correction. If such notification of defect is sent, the required payment date shall be thirty (30) days after receipt of the corrected invoice.

Interest: Section 126.30 of the Ohio Revised Code may be applicable to this Contract and, if so, requires payment of interest on overdue payments for all proper invoices. The interest charge shall be at a rate per calendar month which equals one-twelfth of the rate per annum prescribed by Section 5703.47 of the Ohio Revised Code.

Termination: If PROPOSER fails to perform any one of its obligations under this Contract, it will be in default and the State may terminate this Contract in accordance with this section. The termination will be effective on the date delineated by the State.

Termination for Default: If PROPOSER's default is unable to be cured in a reasonable time, the State may terminate the Contract by written notice to the PROPOSER.

Termination for Unremedied Default: If PROPOSER's default may be cured within a reasonable time, the State will provide written notice to PROPOSER specifying the default and the time within which PROPOSER must correct the default. If PROPOSER fails to cure the specified default within the time required, the State may terminate the Contract. If ODOT does not give timely notice of default to PROPOSER, the State has not waived any of the State's rights or remedies concerning the default.

Termination for Persistent Default: The State may terminate this Contract by written notice to PROPOSER for defaults that are cured, but persistent. "Persistent" means three or more defaults. After the State has notified the PROPOSER of its third default, the State may terminate this Contract without providing PROPOSER with an opportunity to cure, if PROPOSER defaults for a fourth time. The four defaults are note required to be related to each other in any way.

Termination for Endangered Performance: The State may terminate this Contract by written notice to the PROPOSER if the State determines that the performance of the Contract is endangered through no fault of the State.

Termination for Financial Instability: The State may terminate this Contract by written notice to the PROPOSER if a petition of bankruptcy or similar proceeding has been filed by or against the PROPOSER.

Termination for Delinquency, Violation of Law: The State may terminate this Contract by written notice, if it determines that PROPOSER is delinquent in its payment of federal, state or local taxes, workers' compensation, insurance premiums, unemployment compensation contributions, child support, court costs or any other obligation owed to a state agency or political subdivision. The State also may cancel this Contract, if it determines that PROPOSER has violated any law during the performance of this Contract. However, the State may not terminate this Contract if the PROPOSER has entered into a repayment agreement with which the PROPOSER is current.

Termination for Subcontractor Default: The State may terminate this Contract for the default of the PROPOSER or any of its subcontractors. The PROPOSER will be solely responsible for satisfying any claims of its subcontractors for any suspension or termination and will indemnify the State for any liability to them. Subcontractors will hold the State harmless for any damage caused to them from a suspension or termination. The subcontractors will look solely to the PROPOSER for any compensation to which they may be entitled.

Termination for Convenience: The State may terminate this Contract for its convenience after issuing a thirty (30) day written notice to the PROPOSER. If the termination is for the convenience of the Sate, the PROPOSER will be entitled to compensation for any Deliverable that the PROPOSER has delivered before the termination. Such compensation will be the PROPOSER's exclusive remedy in the case of termination for convenience and will be available to the PROPOSER only after the PROPOSER has submitted a prior invoice for such, with the invoice reflecting the amount determined by the State to be owing to the PROPOSER.

Termination, Effectiveness, PROPOSER Responsibilities: The notice of termination whether for cause or without cause will be effective as soon as PROPOSER receives it. Upon receipt of the notice of termination, PROPOSER will immediately cease all work, if applicable, and refuse any additional orders and take all steps necessary to minimize the costs that PROPOSER will incur related to this Contract.

Strict Performance: The failure of either party at any time to demand strict performance by the other party of any of the terms of this Contract will not be construed as a waiver of any such term, and either party may at any time demand strict and complete performance by the other party.

Suspension: If PROPOSER fails to perform any one of its obligations under this Contract, it will be in default and the State may suspend rather than terminate this Contract where the State believes that doing so would better serve its interest. In the case of a suspension for the State's convenience, the amount of compensation due to the PROPOSER for work performed before the suspension will be determined in the same manner as provided in the above section for termination for the State's convenience or the PROPOSER may be entitled to compensation for work performed before the suspension, less any damage to the State resulting from the Contactor's breach of this Contract or other fault. The notice of suspension, whether with or without cause, will be effective immediately on the PROPOSER's receipts of the notice.

Contract Remedies:

Actual Damages: PROPOSER is liable to the State of Ohio for all actual and direct damages cause by PROPOSER's default. The State may substitute supplies or services, from a third party, for those that were to be provided by PROPOSER. The State may recover the costs associated with acquiring substitute supplies or services, less any expenses or costs saved by PROPOSER's default, from PROPOSER. Neither Party shall be liable for any Special, Punitive, or indirect damages.

Liquidated Damages: If actual and direct damages are uncertain or difficult to determine, the State may recover liquidated damages in the amount of 1% of the value of the order, deliverable or milestone that is the subject of the default, for every day that the default is not cured by the PROPOSER.

Deduction of Damages from Contract Price: The State may deduct all or any part of the damages resulting from PROPOSER's default from any part of the price still due on the contract, upon prior written notice to being issued to the PROPOSER by the State.

Non-Discrimination/Compliance with applicable laws: PROPOSER, as a term of the Contract, shall comply with Civil Rights Act of 1964, the Federal Rehabilitation Act of 1973, any and all applicable Federal Executive Orders, any and all applicable Ohio Governor Executive Orders, and any and all other statutes, rules and regulations pertaining to non-discrimination. Proposer further agrees that it is in compliance with the requirements of Ohio Revised Code Section 125.111.

Governing Law: This Contract shall be governed, construed, and interpreted in accordance with the laws of the State of Ohio. To the extent that ODOT is a party to any litigation arising out of, or relating in any way to, this Contract or the performance thereunder, such an action shall be brought only in a court of competent jurisdiction in Franklin County, Ohio.

Drug-free Workplace: PROPOSER agrees to comply with all applicable state and federal laws regarding drug-free workplace. Proposer shall make a good faith effort to ensure that all employees, while working on state property, will not purchase, transfer, use or possess illegal drugs or alcohol or abuse prescription drugs in any way.

Ohio Ethics Law: PROPOSER agrees that they are currently in compliance and will continue to adhere to the requirements of Ohio Ethics law as provided by Section 102.03 and 102.04 of the Ohio Revised Code.

Banning the Expenditure of Public Funds on Offshore Services: The PROPOSER affirms to have read understands Executive Order 2011-12K and shall abide by those requirements in the performance of this Contract, and shall perform no services required under this Contract outside of the United States.

The PROPOSER also affirms, understands, and agrees to immediately notify the State of any change or shift in the location(s) of services performed by the PROPOSER or its subcontractors under this Contract, and no services shall be changed or shifted to a location(s) that are outside of the United States.

Independent Contractor Acknowledgment: It is fully understood and agreed that PROPOSER is an independent contractor and is not an agent, servant, or employee of the State of Ohio or the Ohio Department of Transportation. PROPOSER declares that it is engaged as an independent business and has complied with all applicable federal, state, and local laws regarding business permits and licenses of any kind, including but not limited to any insurance coverage, workers' compensation, or unemployment compensation that is required in the normal course of business and will assume all responsibility for any federal, state, municipal or other tax liabilities. Additionally, PROPOSER understands that as an independent contractor, it is not a public employee and is not entitled to contributions from the State to any public employee retirement system.

Termination. Sanction. Damages: If PROPOSER or any of its subcontractors perform services under this Contract outside of the United States, the performance of such services shall be treated as a material breach of the Contract. The State is not obligated to pay and shall not pay for such services. If PROPOSER or any of its subcontractors perform any such services, PROPOSER shall immediately return to the State all funds paid for those services. The State may also recover from the PROPOSER all costs associated with any corrective action the State may undertake, including but not limited to an audit or a risk analysis, as a result of the PROPOSER performing services outside the United States.

The State may, at any time after the breach, terminate the Contract, upon written notice to the PROPOSER. The State may recover all accounting, administrative, legal and other expenses reasonably necessary for the preparation of the termination of the Contract and costs associated with the acquisition of substitute services from a third party.

If the State determines that actual and direct damages are uncertain or difficult to ascertain, the State in its sole discretion may recover a payment of liquidated damages in the amount of 10% of the value of the Contract.

The State, in its sole discretion, may provide written notice to PROPOSER of a breach and permit the PROPOSER to cure the breach. Such cure period shall be no longer than 21 calendar days. During the cure period, the State may buy substitute services from a third party and recover from the PROPOSER any costs associated with acquiring those substitute services.

Notwithstanding the State permitting a period of time to cure the breach or the PROPOSER's cure of the breach, the State does not waive any of its rights and remedies provided the State in this Contract, including but not limited to recovery of funds paid for services the PROPOSER performed outside of the United States, costs associated with corrective action, or liquidated damages.

Assignment/Delegation: The PROPOSER will not assign any of its rights, nor delegate any of its duties and responsibilities under this Contract, without prior written consent of the State. Any assignment or delegation not consented to may be deemed void by the State.

Workers Compensation PROPOSER shall provide its own workers compensation coverage throughout the duration of the contract and any extensions thereof. ODOT is hereby released from any and all liability for injury received by the PROPOSER, its employees, agents, or subcontractors, while performing tasks, duties, work, or responsibilities as set forth in this Contract.

Indemnification and Hold Harmless: PROPOSER shall indemnify and hold harmless the State of Ohio, Department of Transportation, and its agents, for all claims, damages, lawsuits, costs, judgments, expenses or other liabilities which arise as a result of the Proposer's employees/agents, acts, actions, omissions, or negligence in the performance of this Contract.

Contract Modifications: This Contract, these terms and conditions, and each of its provisions shall be binding upon both parties execution and may not be waived, modified, amended, or altered except in writing signed by the Director of ODOT and the PROPOSER.

State Audit Findings: PROPOSER affirmatively represents to the State that it is not subject to a finding for recovery under R.C. 9.24, or that it has taken the appropriate remedial steps required under R.C. 9.24 or otherwise qualifies under that section. Proposer agrees that if this representation is deemed to be false, the contract shall be void *ab initio* as between the parties to this contract, and any funds paid by the State hereunder shall be immediately repaid to the State, or an action for *recovery* may be immediately commenced by the State for recovery of said funds.

Public Records Request: In accordance with all applicable Ohio Public Records laws, the PROPOSER acknowledges that their submitted proposal, pricing, communications, agreement, etc. shall be, to the extent applicable, public record and made available upon request to interested parties. The ODOT shall take all necessary measures in responding to Public Record Requests to not release clearly marked proprietary or confidential information contained within a PROPOSER's proposal.

Force Majeure: Except as otherwise provided herein, neither the PROPOSER nor ODOT shall be liable to the other for any delay or failure of performance of any provisions contained herein, nor shall any such delay or failure or performance constitute default hereunder, to the extent that such delay or failure is caused by force majeure. The term force majeure, as used herein shall mean without limitation: acts of God, such as epidemics; lightning; earthquakes; fire, storms; hurricanes; tornadoes; floods; washouts; droughts, or other severe weather disturbances; explosions; arrests; labor strikes; restraint of government and people; and other such events or any other cause which could not be reasonably foreseen in the exercise of ordinary care, and which is beyond the reasonable control of the party affected and said party is unable to prevent.

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7. SIGNATURE PAGE

SIGNATURE PAGE
REQUEST FOR PROPOSAL #521A-16
SPEED DATA SERVICES

This Signature Page must be completed and accompanied with a Proposer's complete proposal response to serve as acknowledgement to the Department that the Proposer understands and will comply with all terms, conditions, and requirements for the above-referenced Request for Proposal.

Furthermore, the execution and submission of this Signature Page shall serve as acknowledgment that the Proposer will enter into a Contract with the State of Ohio, Department of Transportation if selected for award of the above-referenced Request for Proposal and understands, upon Contract award and the Department's execution of this Signature Page, it shall be bound by all terms and conditions in the performance of Speed Data Services referenced in this RFP. Proposal responses not containing an original, signed Signature Page will be considered non-responsive and ineligible for award of this Request for Proposal.

The person signing and executing this Signature Page below acknowledges that he/she is signing on behalf of their Company in a representative capacity and hereby warrants that he/she has been duly authorized by his/her Company to submit this formal offer and is authorized to execute Contracts on such Company's behalf.

Date: _____

By: _____
Authorized signature by Officer of the Company (please sign in blue ink)

_____
Type or print name shown above

_____
Title of Officer Signing

_____
Name of Company (Responding Proposer)

_____
Federal Tax ID

FOR USE BY THE OHIO DEPARTMENT OF TRANSPORTATION ONLY:

A signature by the Director of ODOT (or approved designee) below represents the Department's acceptance of the above-Proposer's submitted proposal and shall effectively form **ODOT Contract #521A-16** between the Parties.

_____ _____
Jerry Wray, Director **Date**
Ohio Department of Transportation

RFP No. 521A-16

8. Appendix A Real-time Data Route Tables

Part 1 Routes					
Route	Begin MP	End MP	Miles	Average Data Point Spacing (miles)	Minimum Data Points
IR 270	0	55	55	1	110
IR 270 C/D	30.8	33.8	3	1	6
IR 270 C/D	40.7	42.9	2.2	1	4
IR 271	0	39.9	39.9	1	80
IR 271 Exp	27.6	41.2	13.6	1	28
IR 275	13.9	25.3	7.7	1	16
IR 275	28.2	73.1	44.9	1	90
IR 277	0.2	3.9	3.7	1	8
IR 280	0	12.4	12.4	1	24
IR 470	0	6.7	6.7	1	14
IR 471	0	0.7	0.7	1	2
IR 475	0	20	20	1	40
IR 480	0	28	28	1	56
IR 480	32.1	42.3	10.2	1	20
IR 490	0.2	1.9	1.7	1	4
IR 670	0	10.4	10.4	1	20
IR 675	0	26	26	1	52
IR 680	0	16.4	16.4	2	16
IR 70	0	24.7	24.7	2	24
IR 70	24.7	65	40.3	1	80
IR 70	65	89.6	24.6	2	24
IR 70	89.6	112.4	22.8	1	46
IR 70	112.4	225.6	113.2	2	112
IR 71	0	19.7	19.7	1	40
IR 71	19.7	97.2	77.5	2	78
IR 71	97.2	106.4	9.2	1	18
IR 71	108	122.4	14.4	1	28
IR 71	122.4	218.9	96.5	2	96
IR 71	208	218.9	10.9	1	22
IR 71	218.9	247.6	28.7	1	58
IR 74	0	19.5	19.5	1	40
IR 75	0.2	27.3	27.1	1	54
IR 75	27.3	65.3	38	1	76
IR 75	65.3	179	113.7	2	114
IR 75	179	211.5	32.5	1	66

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IR 76	0	34.9	34.9	1	70
IR 76	34.9	59.9	25	2	24
IR 77	0	101.2	101.2	2	100
IR 77	101.2	125	23.8	1	48
IR 77	129	142.3	13.3	1	26
IR 77	142.3	162.6	20.3	1	40
IR 80	219.2	237.3	18.1	2	18
IR 90	142.9	203.5	60.6	1	122
IR 90	203.5	244	40.5	2	40
SR 104	90	95.2	5.2	1	10
SR 126	6.8	20.2	13.4	1	26
SR 161	41.2	46.2	5	1	10
SR 176	16	18.8	2.8	1	6
SR 2	114	168	54	2	54
SR 2	191.8	196.4	4.6	1	10
SR 2	207.8	223.3	15.5	1	32
SR 21	32.4	38.2	5.8	1	12
SR 315	0	12	12	1	24
SR 4	55	65	10	1	20
SR 562	0	3.4	3.4	1	6
SR 8	0.2	14.4	14.2	1	28
US 224	10.2	12.2	2	1	4
US 30	0	135.5	135.5	2	136
US 30	177.6	195.8	18.2	2	18
US 33	92.1	108.7	16.6	1	34
US 33	128.5	150.5	22	1	44
US 35	30	112.8	82.8	1	166
		Total:	**1776.5**	**miles**	**2694**

Part 2 Routes					
Route	Begin MP	End MP	Miles	Max Avg Data Point Spacing (miles)	Minimum Data Points
SR 11	10	41	31	2	30
SR 11	46	99.5	53.5	2	54
SR 15	85.2	102.3	17.1	2	16
US 23	0	83.2	83.2	2	82
US 23	101.2	124.4	23.2	1	46
US 23	124.4	167.5	43.1	2	42
US 23	232	234.8	2.8	1	6
US 24	0	68	68	2	68

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RFP No. 521A-16

US 30	236	247	11	2	10
US 33	62.5	92.1	29.6	2	30
US 33	150.5	221.1	70.6	2	70
US 35	115.3	173.2	57.9	1	116
US 422	13.9	31	17.1	1	34
US 62	231.65	233.49	1.84	1	4
US 68	95.1	110.5	15.4	2	14
SR 4	71.4	76.6	5.2	1	10
SR 49	0	9	9	1	18
SR 129	17.4	25.4	8	1	16
SR 161	46.2	57.6	11.4	2	10
SR 37	101.6	106.2	4.6	2	4
SR 16	27.1	36.1	9	2	8
SR 315	12	22.5	10.5	1	22
SR 711	0	3	3	1	6
SR 750	4.4	9	4.6	1	10
SR 795	2.3	9.1	6.8	1	14
		Total:	**597.4**	**miles**	**740**

Total: Part 1 + Part 2	**2373.9**	**miles**	

RFP No. 521A-16

9. Appendix B: Real-time Data Routes Map

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APPENDIX D3 OHIO DOT OD DATA RFP

Invitation No.: 530-18
Location: Statewide
Commodity: Origin Destination Data Service
Pricing: http://www.dot.state.oh.us/Divisions/ContractAdmin/Contracts/PurchDocs/530pricing.xls

Request For Proposal (RFP)

State of Ohio, Department of Transportation
Office of Contract Sales, Purchasing Services
Jerry Wray, Director

Proposal Submission Deadline (Proposal Opening Date):
May 18, 2017 at 2:00 p.m. eastern time

Submitted by:

Company Name: _____

Federal Tax ID No.: _____

Physical/Mailing Address:	Remit to Payment Address:
Street Address:	
P.O. Box:	
City:	
St:	
Zip:	
Contact Person and Phone Number: (authorized to answer questions about your company's bid)	
E-Mail Address (required): (person who filled out bid)	
E-Mail Address (required): (for notification of future bid opportunities)	

Telephone Number	800 Number	Fax Number

Return Properly Marked, Complete Bid Packages To:
Ohio Department of Transportation
Office of Contract Sales, Purchasing Services, 1st floor
1980 West Broad St. Mail Stop 4110
Columbus, OH 43223

BIDDERS MUST SUBMIT ANY QUESTIONS, CLARIFICATIONS, OR INQUIRIES REGARDING THIS INVITATION TO BID VIA THE FOLLOWING WEBSITE:
http://www.dot.state.oh.us/Divisions/ContractAdmin/Contracts/Pages/PurchasePBQ.aspx

136 Practices on Acquiring Proprietary Data for Transportation Applications

Invitation No. 530-18

Contents

OHIO DEPARTMENT OF TRANSPORTATION
REQUEST FOR PROPOSALS (RFP): 530-18
Origin-Destination Data Services

GENERAL OVERVIEW

1.1 Overview

The Ohio Department of Transportation (ODOT) is seeking the services of qualified Proposers to provide Origin-Destination (OD) data via a web based interface. Included with the data shall be a mechanism to query the underlying data set for various use cases by numerous public agencies in Ohio. Access to the data shall be internet account based and available to any Ohio public agency as determined solely by ODOT (Local Governments, Metropolitan Planning Organizations (MPO's), Universities, Transit Agencies, Other State of Ohio Agencies, etc.). There shall be no restriction on an Ohio public agency account holder related to the use of the OD data, however, ODOT will not provide unlimited access to private entities.

While unlimited account access will not be given to private entities, ODOT or an approved Ohio public agency account holder shall be able to provide the OD query results to a consultant(s) or a similar private entity working on their projects solely for use in that project. Approved account holders shall also be allowed to temporarily provide access to the OD data query tool to a private entity (such as a consultant) in order to perform queries solely for the purpose of working on that public agency's project. At the conclusion of the project work that requires the OD information, access to the OD data will be withdrawn from the private entity.

SCOPE OF WORK & SPECIFICATIONS OF DELIVERABLES

Scope of Work
ODOT is seeking access to accurate OD information for numerous transportation related use case projects. Access to the data shall be via a user friendly web based interface (query tool) that allows for flexible queries to support the various use cases. In addition to the OD Data and Query Tool the Proposer shall also provide Technical Support and Training as described in this RFP.

Data
The Proposer may gather the OD data from whatever means they deem acceptable, however, the data should be representative of the vehicle mixtures utilizing our roadway systems. OD Data shall as a minimum cover Ohio's National Highway System (NHS) and any State or U.S. Route. The Proposer's discussion of their available data shall as a minimum include:

a. Availability and accuracy of TAZ spatial level, temporal level and user class data;
b. Ability to provide daily average, hourly or other sub-daily breakdowns;
c. Ability to accurately provide vehicle mix representation (cars vs. trucks, resident vs. non-resident, personal vs. business, others);
d. Discussion of the effects of trip length distribution biases on the data;
e. Discussion of how many years of historical data is available for query as well as the frequency that new data is added to the data set;

In addition to the above, RFP responses shall include a discussion of their data set accuracy. This discussion may be quantitative and/or qualitative as deemed appropriate by the Proposer

and may include studies (internal, 3rd party, academic, etc.). If studies are provided they can be attached to the RFP response. Alternatively, the Proposer may also provide links to these studies if they are available on the internet. Study pages provided in an appendix to document data set accuracy do not count toward the provided page limits. Information related to the data as outlined in this section will be evaluated by ODOT as part of the RFP scoring criteria. Data availability beyond the NHS/State Route/U.S. Route minimum requirement should be cited in this section as well as referenced in the Summary as potentially exceeding the minimum RFP requirements (See the Summary Section).

Unless stated otherwise, all Deliverables provided by the Contractor shall become the intellectual property of ODOT and ODOT shall have an unrestricted right to reproduce, distribute, modify, maintain, and use the Deliverables. Contractor shall not obtain copyright, patent, or other proprietary protection for the Deliverables. Contractor shall reserve its rights in all methods, pre-existing work, and pre-existing software applications and data, used to prepare such Deliverables.

Data Query

The Proposer shall offer an internet based means to query the OD data set. It is ODOT's desire for any approved account holders to be able to perform their own queries (i.e., ODOT will not have to perform queries for other public entities). Included with the RFP response shall be a description of how the data is queried including information such as:

1. How a query is performed;
2. Relative ease of use;
3. Typical time required to receive information from a query;
4. Versatility of the query mechanism;
5. The outputs provided by the query;
6. Other features that the Proposer believes ODOT may deem to be desirable.

The strengths/weaknesses of the proposed OD query tool will be part of the RFP scoring criteria.

Technical Support

The Proposer shall provide technical support to all Ohio account holders that ODOT approves to use and query the OD data set proposed in this RFP. The Proposer shall describe how technical support will be provided as part of this contract. As a minimum, Technical Support shall be available to any licensed user via web page/email.

The Proposer shall provide information with their RFP response describing their offered technical support. Any additional technical support offered beyond the minimum should be noted as well as referenced in the Summary as potentially exceeding the minimum RFP requirements (See the Summary Section).

The proposed technical support will be part of the RFP scoring criteria.

Training

The Proposer shall provide as a minimum the following training within one month of the execution date of the contract. ODOT will work with the successful Proposer to determine mutually agreeable dates and times.

1. Two in person one day (4-6 hours as necessary) training classes on the data set including how to create and interpret queries. Both of these one day training classes will be held at an ODOT facility in Columbus. These training classes may be on two consecutive days to minimize travel costs. Dates of the training classes will be by mutual agreement.
2. Three webinars that can be viewed internally and external to ODOT. It is anticipated that these webinars will be the primary means of providing training to other Ohio public agencies. The proposer does not have to be in Columbus to provide the webinar if they have the ability to provide the webinar training from a different location. ODOT will assist with advertising the dates of the webinar to other public agencies.

The Proposer shall provide information with their RFP response describing their offered training. Any additional training opportunities offered beyond the minimum training described above should be noted as well as referenced in the Summary as potentially exceeding the minimum RFP requirements (See the Summary Section).

The proposed training will be part of the RFP scoring criteria.

VENDOR QUALIFICATIONS AND EXPERIENCE

Qualifications

The Proposers shall include a description of their qualifications, experience and any other reasons why they believe they are the most qualified to provide the OD Data services described in this RFP. Qualifications will be used as part of the RFP scoring criteria.

Experience with Transportation Use Cases

It is ODOT's desire to purchase access to a data set that has been successfully used by other public agencies for transportation related use cases. The Proposer's data set shall have been used in a minimum of four (4) completed transportation based use case projects that were sponsored by a public agency. The proposal shall summarize these four projects. With each cited project include a brief project description highlighting the use case along with public agency references for the projects. Additional completed projects beyond the four minimum required may also be provided in this section. Additional public agency sponsored transportation use case projects in excess of the four minimum may also be provided and cited in the Summary as potentially exceeding the minimum RFP requirements (See the Summary Section).

Previous successful project experience of the OD data will be part of the RFP scoring criteria

Summary

Proposers may provide up to a two page summary of their proposal to summarize why they believe they are the most qualified Proposer. The Summary should also be used to reiterate or discuss any additional offerings above the minimum requirements of this RFP. If ODOT deems these additional offerings to be beneficial, they may possibly receive additional scoring consideration as denoted in the Scoring section of the RFP. It shall be solely ODOT's discretion if additional offerings merit consideration for additional scoring.

The additional offerings in the summary content will be used as part of the RFP scoring criteria.

Contract Duration
Contract duration shall be one year from the date of the executed contract with ODOT having the unilateral ability to extend the contract two times for one year each (i.e., maximum of three years if ODOT decides to execute both of the one year extensions). ODOT makes no guarantees related to extending the contract for a second or third year.

Contract Pricing
The Proposer shall include pricing by completing the pricing sheet and submitting it with their RFP response. The price provided by the Proposer shall be all inclusive including technical support, training and shall include all updates to the data set and/or the query tool. No additional compensation shall be provided above the yearly price offered by the Proposer. Proposed pricing will be part of the RFP scoring criteria.

Demonstration
After all Proposals are submitted, ODOT will score them as noted below. At the conclusion of the scoring ODOT will, based upon scoring, decide if a conditional selection will be made or if further evaluation is necessary via a Short List selection process.

1. Conditional Selection – A conditional selection will be made if ODOT believes that sufficient information, scoring results and our understanding of the Proposal justify one Proposer to be conditionally selected. If a conditional selection is made that Proposer will be invited to provide a Demonstration. Based upon the results of this Demonstration ODOT may opt to make the selection final. Alternatively, based upon the results of the Demonstration ODOT may opt to continue the selection process via implementation of a short list selection.
2. Short List Selection – A short list selection may be made if in ODOT's opinion that multiple Proposals could potentially meet our needs. In the case of a short list selection multiple Proposers will be invited to provide a Demonstration. In the event of a Short List selection, scoring will be performed again after completion of the Demonstrations to make the final selection.

In either case, the Demonstrations will focus on how the data is queried utilizing potential use cases as examples. In addition, during the Demonstration ODOT may ask for clarifications or additional information regarding the RFP response, the data set or the query tool. Invited Demonstrations will be given 90 minutes for their presentation and to answer ODOT questions or clarification requests. Demonstrations will be stopped after 90 minutes.

The Demonstration may be in person (ODOT Central Office) or via webinar format at the discretion of the Proposer. If a webinar format is used it shall be the responsibility of the Proposer to host the webinar. The demonstration will be at a mutually agreed upon date and time, however, it shall occur within 42 days of the RFP release date.

RFP Process Schedule
RFP Released: April 26, 2018
Proposals Due: May 18, 2017
Training – within one month after the contract execution date
ODOT reserves the right to unilaterally revise the above estimated schedule.

RFP Scoring

Category	Weight	Rating 0-5	Extended Score
Qualifications	10		
Data	25		
Experience with Transportation Use Cases (including references)	20		
Data Query	20		
Technical Support	10		
Training	15		
Summary (possible additional points based upon proposed offerings above and beyond minimum RFP requirements)	10		
Total Technical Score Possible	550		
Cost Proposal Points	110		

COST PROPOSAL POINTS.

ODOT will calculate the Offeror's Cost Proposal points after the Offeror's total technical points are determined, using the following method: Cost points = (lowest Offeror's cost/Offeror's cost) x Maximum Allowable Cost Points as indicated in the "Scoring Breakdown" table. The value is provided in the Scoring Breakdown table. "Cost" = Total Contract Cost identified in the Cost Summary section of Offeror Proposals. In this method, the lowest cost proposed will receive the Maximum Allowable Points. The number of points assigned to the cost evaluation will be prorated, with the lowest accepted cost proposal given the maximum number of points possible for this criterion. Other acceptable cost proposals will be scored as the ratio of the lowest price proposal to the proposal being scored, multiplied by the maximum number of points possible for this criterion. An example for calculating cost points, where Maximum Allowable Cost Points Value = 60 points, is the scenario where Offeror X has proposed a cost of $100.00. Offeror Y has proposed a cost of $110.00 and Offeror Z has proposed a cost of $120.00. Offeror X, having the lowest cost, would get the maximum 60 cost points. Offeror Y's cost points would be calculated as $100.00 (Offeror X's cost) divided by $110.00 (Offeror Y's cost) equals 0.909 times 60 maximum points, or a total of 54.5 points. Offeror Z's cost points would be calculated as $100.00 (Offeror X's cost) divided by $120.00 (Offeror Z's cost) equals 0.833 times 60 maximum points, or a total of 50 points.

Cost Score: _____

Proposal Page Restrictions

One page shall be considered one printed side. If text is printed on two sides that will be counted as two pages.

Introduction/Qualifications	2 pages
Data	3 pages (note – if Proposers choose to include studies related to their data accuracy the studies may be attached as an appendices or alternatively one additional page can be included solely for the purpose of providing URL links to studies)
Experience with Transportation Use Cases (including public agency references)	3 pages
Data Query	3 pages
Technical Support	1 page
Training	1 page
Summary	2 pages
Price	1 page (Completed pricing sheet)

Invitation No. 530-18

State of Ohio, Department of Transportation (ODOT)
Office of Contract Sales, Purchasing Services

Terms and Conditions for Submitting Excel Pricing File in Bid Package

(Last Revised 11/2016)

1. DOWNLOADING THE EXCEL PRICING FILE: Bidders can access and download the most current Excel Pricing File for this invitation to bid by following the hyperlink provided below:

http://www.dot.state.oh.us/Divisions/ContractAdmin/Contracts/PurchDocs/530pricing.xls

2. SUBMISSION OF EXCEL PRICING FILE: Bidders should submit both a media device with the completed electronic Excel pricing file (.xls) and a hard copy print out of the completed Excel file in their submitted bid package. The media device should be marked with the bidder's name and the Invitation to Bid number.

"Media Device"- Compact Disc (CD), DVD (Digital Versatile Disc), or Flash Drive

Failure to submit this media device with a completed Excel price sheet from the Department's Microsoft Excel file and the hard copy print out of the completed Excel price sheet may result in a bid being deemed non-responsive by the Department.

3. DISCPREPANCIES IN SUBMITTED INFORMATION: In the event there is a discrepancy between the information submitted on the media device and the hard copy Excel price sheet, the information submitted on the media device will take precedence.

4. NON-FUNCTIONAL MEDIA DEVICE: The Department shall not be held liable in the event a bidder's media device is not functional, is broken, or is unable to be accessed/downloaded by the Department for any reason. Bidders should take care to ensure all submitted media devices are properly protected during transport.

5. UNAPPROVED ALTERATIONS TO EXCEL PRICING FILE: Bidders who materially alter the original content of the Excel pricing file (e.g. specifications, formulas, etc.) issued by the Department may be found non-responsive and ineligible for award of this invitation to bid.

6. CHANGES TO EXCEL PRICING FILE: The Department will only make modifications to the Excel pricing file by written addendum only. Where changes are necessary to the Excel pricing page, the Department will issue a new Excel pricing page indicating the revisions made and a revision date for the changes.

It is the sole responsibility of the bidder to check for issued addenda prior to submitting a bid package to ensure the most updated Excel pricing file is being utilized.

7. DESCRIPTIVE LITERATURE: Bidders may electronically, on their submitted media device, provide any descriptive literature (e.g. brochures, spec/cut sheets, drawings, MSDS, etc.) regarding the products and/or services offered by the bidder. As this literature may be publically posted for viewing by purchasers, bidders must not submit any literature electronically in which they consider to be a trade secret, proprietary, or confidential in any way.

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Invitation No. 530-18

State of Ohio, Department of Transportation (ODOT)
Office of Contract Sales, Purchasing Services

INSTRUCTIONS, TERMS AND CONDITIONS FOR BIDDING

(Last revised 11/2016)

1. **BIDDER REGISTRATION**: The Department requires awarded bidder(s) to successfully register as a State of Ohio Supplier with the Department of Ohio Shared Services and successfully obtain an OAKS vendor identification number (OAKS ID) within fourteen (14) calendar days from the date of contract award and execution. The Department cannot utilize awarded Contracts to purchase from a bidder who cannot obtain an OAKS ID from Ohio Shared Services. In the event an awarded bidder is unable to obtain an OAKS ID, the Department shall reserve the right to revoke its award to the bidder and immediately cancel any resulting Contract.

   A Supplier Information Form and W-9 must be completed and sent back directly to Ohio Shared Services in order to register and apply for an OAKS ID. The following website can be accessed by bidders to obtain both the forms and specific instructions for obtaining an OAKS ID:

   http://ohiosharedservices.ohio.gov/SupplierOperations/Forms.aspx

   It is strongly recommended that all interested bidders not already registered with Ohio Shared Services submit the above paperwork prior to the bid submission deadline.

2. **HOW BIDS MUST BE PACKAGED**: All submitted bids in response to this Invitation to Bid (ITB) must be submitted in a sealed envelope or box (envelope means any type of sealed, opaque container) marked with the ITB number, the title of the ITB, bid submission deadline (bid opening date), and bidder (company) name clearly marked on the outside of the envelope/box. If a bidder is using an "Express Mail" or similar type of service, the bid response must be contained in a sealed envelope within the "Express" mailer (the bid number must be listed on the exterior of the sealed envelope contained within the "Express" mailer). A bid that is not properly and clearly marked and is inadvertently opened, before the scheduled bid opening time, may be disqualified, at the Department's discretion, without additional consideration for award of the contract.

   Below is an example to illustrate how the outer surface of the bid package should be labeled:

   Invitation to Bid #: *(insert bid number)*
   Commodity/Service: *(insert title of bid)*
   Bid Submission Deadline: *(insert due date)*
   Company Name: *(insert company name)*

3. **WHAT NEEDS INCLUDED IN BID PACKAGE**: Submitted bid packages should include, at a minimum, a completed Signature Page, a hard copy print out of this entire invitation to bid document, media device with a completed Excel pricing page, hard copy of the completed Excel pricing page, and all necessary supportive documentation, forms, and any other information required herein. The Department may deem a bid non-responsive for failure to submit any of the documents requested above.

4. **PREBID QUESTIONS, DISCREPANCIES, AND CLARIFICATIONS:** Any discrepancies, omissions, ambiguities, or conflicts in or among the bidding documents or doubts as to the meaning shall be brought to the Department's attention by the bidder no less than three (3) business days prior to the bid submission deadline. All questions, discrepancies, clarifications, etc. must be submitted electronically (hyperlink below). During the competitive bidding process, bidders (and their agents) are prohibited from contacting any ODOT office, including District offices, other than the Office of Contract Sales, Purchasing Services section to obtain responses to any questions. The Department may find a bidder non-responsive for failing to adhere to any of the above requirements.

   Pre-bid questions/inquiries must be submitted electronically through the following website:
   http://www.dot.state.oh.us/Divisions/ContractAdmin/Contracts/Pages/PurchasePBQ.aspx

Answers to Pre-Bid Questions/Inquiries will be posted on the following document available for download at the following website:
http://www.dot.state.oh.us/Divisions/ContractAdmin/Contracts/Purchase/PBQ-Answers.doc

It is each bidder's sole responsibility to check the website for updates to pre-bid questions and answers before submitting its bid package to the Department.

5. **MODIFICATIONS TO THE BIDDING DOCUMENTS:** When it is deemed necessary to modify these bidding documents, the Department will only do so by written addendum. The issuance of an addendum is dependent upon the information received and the impact on the competitive bid process. All issued addenda will be posted to the Department's Upcoming ITB's website and shall be automatically incorporated into the bidding/contract documents:

http://www.dot.state.oh.us/Divisions/ContractAdmin/Contracts/Lists/PurchaseUpcomingITBs/UpITBs.aspx

In addition to posting on the above website, the Department also may email addenda information out to all known bidders for convenience purposes only. The Department shall not be held responsible for a bidder's failure to receive the email with the addenda information. It is the sole responsibility of all interested bidders to diligently visit the above-listed website to see if any addenda have been issued prior to submitting their bid to the Department. Those interested in obtaining addenda information via email for a particular invitation to bid must send the Department its request in writing to the following email address:
Contracts.Purchasing@dot.ohio.gov

6. **PRE-BID CONFERENCES**: The Department reserves the right to hold mandatory or optional pre-bid conferences at its discretion. Conferences may be held either in-person or via webinar/phone conference formats. Bidders will be required to sign-in at all pre-bid conferences. The sign-in sheet for all pre-bid conferences is considered a public record, will be kept in the bid file, and will be shared with any requesting party. Additionally, any business cards collected during any pre-bid conference shall be considered public records and may be distributed out to all conference attendees. Any changes to the requirements or specifications of an invitation to bid, as a result of the pre-bid conference content, will be made by written addendum and publicly posted.

For mandatory pre-bid conferences, the Department requires that those companies intending on submitting a bid be in attendance for the entire duration of the pre-bid conference. Mandatory pre-bid conferences will officially begin five (5) minutes after the scheduled date and start time at the location specified in the Special Terms and Conditions. Those bidders not in attendance at that time will be considered ineligible to submit a bid. The conference will be considered adjourned and complete when a representative of the Office of Contract Sales, Purchasing Services section indicates so. To be considered in attendance and eligible to bid, a bidder must have at least one representative of the company in attendance. A single representative cannot be present on behalf of two or more companies (bidders). Each company (bidder) must send its own representative on behalf of their organization. It is the sole responsibility of the bidder to ensure that the representative follows the sign-in procedures to properly document the bidder's attendance. The Department shall not be held responsible for a bidder's failure to arrive at the meeting on time, properly sign-in, or failure to stay for the entire duration of the meeting.

7. **WHERE BIDS MUST BE DELIVERED TO**: The Department only accepts hand delivered and mailed bid packages. Bids submitted via email, telephone, electronic facsimile (fax), or any other mode of electronic transmission will not be considered a responsive bid submission. Bids must be in possession of the ODOT Office of Contract Sales, Purchasing Services section, on or prior to 2:00 p.m. eastern time, on the scheduled date of the bid submission deadline (public bid opening) as listed on the cover of this Invitation to Bid (ITB). Properly labeled bid packages must be either hand delivered by the bidder to the Office of Contract Sales, Purchasing Services section or mailed to the following EXACT address:

Ohio Department of Transportation,
Office of Contract Sales, Purchasing Services, 1st floor
1980 West Broad St. Mail Stop 4110
Columbus, OH 43223
(614) 644-7870 or (614) 752-9017
Main Office Line: 1-800-459-3778
OFFICE HOURS: 7:30-3:30, M-F (excluding State of Ohio recognized holidays)

For hand delivery of bids, the Office of Contract Sales, Purchasing Services section is located on the 1st floor of ODOT Central Office (same address as where bids will be received). Bidders will be required to sign-in at the front desk of the building and then must be escorted back to the Office of Contract Sales, Purchasing Services section in order to drop off their bid. It is the responsibility of the bidder to ensure enough time is allotted to allow for all sign in and security procedures prior to the 2:00 p.m. bid submission deadline. Delivery of bids to any other location (including the ODOT mailroom), does not constitute receipt by the Purchasing Services section. Bids delivered to the ODOT mail room by a courier service must be delivered so as to leave a reasonable amount of time for the transfer of the bid to the Purchasing Services section. The ODOT mail room delivers received mail to Purchasing Services at scheduled times during normal office hours.

8. **LATE BIDS:** A bid received after 2:00 p.m. eastern time, on the bid submission deadline (bid opening date) established, shall be deemed "Late" and will not be considered for award of this invitation to bid. The late bid package will be marked as late, remain sealed, and will be kept in the Department's bid file to serve as official record of a late bid having been received.

   Note: The Office of Contract Sales, Purchasing Services timeclock takes precedence over any other timekeeping device (e.g. cell phones, other ODOT clocks, wrist watches, etc.) and will be utilized by the Department to determine whether or not a bid was received by the 2:00 p.m. deadline.

9. **PUBLIC BID OPENING PROCEDURE**: All bids in possession of the Purchasing Services section shall be publicly opened, at ODOT Central Office, Office of Contract Sales, Purchasing Services section, 1st floor, starting at 2:01 p.m. on the scheduled date of public bid opening (bid submission deadline). All bids will be opened and read to any interested parties in attendance. At the conclusion of the public bid opening, bids may no longer be shared with interested parties until after a contract award has been made.

10. **BIDS FIRM**: Once publicly opened, all bids are firm and cannot be altered by the bidder. Once a Contract is awarded and executed, the Vendor shall deliver all products and/or services at the bid prices and terms contained in the Contract. All submitted bids shall remain valid for a period of sixty (60) calendar days after the date of the public bid opening. Beyond sixty (60) calendar days, bidders will have the option to either honor their submitted bid or make a written request to withdraw their bid from consideration. The Ohio Department of Transportation shall receive the benefit of any decrease in price during the sixty (60) day period.

11. **WITHDRAWAL OF BIDS**: A bidder may, by way of written notice to the Purchasing Services section, request to withdraw their bid response prior to the bid submission deadline. The request must be received by the Purchasing Services section PRIOR to the start of the public bid opening (beginning at 2:01 p.m.) on the date of the bid submission deadline. Such written notice must set forth the specific reasons for the bid withdrawal.

    For requests to withdrawal a bid after the public bid opening has begun, the bidder may request to withdraw their bid response from consideration if the unit bid price(s) submitted are unreasonably lower than the other bids received, provided the bid was submitted in good faith, and the reason for the unit bid price(s) being substantially lower was due to an unintentional and substantial arithmetical error or unintentional omission of a substantial quantity of material or labor in the compilation of the bid. Written notice of any such request to withdraw after the bid opening must be received by the Purchasing Services section within no later than forty-eight (48) hours of the scheduled public bid opening.

The decision to allow a bid to be withdrawn is at the sole discretion of the Purchasing Services section. If the bid is to be awarded by category, lot, or group the withdrawal request will apply to all items within the category, lot, or group. All documents and conversations relating to any withdrawal request will become a part of the permanent bid file.

12. **MODIFICATION OF SUBMITTED BIDS PRIOR TO PUBLIC BID OPENING**: A bidder may request to modify their bid response prior to the scheduled date and time set for the public bid opening (i.e. bid submission deadline). To modify a bid response, the bidder must provide an alternate, complete bid package containing all required forms and necessary documents. The alternate bid package must be marked somewhere on the outer packaging as "REVISED". Purchasing Services will not return the original bid package to the bidder. The original bid package will be kept in the contract file.

In order to protect the integrity of the bidding process, bids shall not be prepared on the premises of ODOT. Any bid which is prepared on the premises of ODOT may be immediately disqualified and receive no further consideration for award.

13. **UNIT BID PRICES**: The unit bid price(s) submitted shall govern the award of this invitation to bid unless otherwise specified in the bid evaluation criteria. The unit bid price should be entered for each required bid item on the Department's pricing page. Use of ditto marks, arrows, or other markings in lieu of the actual unit price may result in a non-responsive bid determination. Lot or group prices listed in the unit bid price area shall be considered as the unit price unless clearly identified as the lot price. Unless specifically allowed in the contract's terms and conditions, requests to change or alter unit bid prices after the public bid opening are prohibited.

The following requirements also apply to unit bid prices:

a. **DECIMAL POINT**: Bidders should not insert a unit cost of more than two (2) digits to the right of the decimal point. Digit(s) beyond two (2) will be dropped and not recognized by the Department for the purposes of bid evaluation or contract award.

b. **CREDIT CARD FEES**: Bidders must incorporate into their unit bid price(s) submitted all costs and fees associated with the State's use of a payment (credit) card.

c. **DISCOUNTS**: While bidders may offer to the Department discounts for prompt payment and other similar incentives, discounts and incentives these will not be used to alter the submitted unit bid price(s) for purposes of bid evaluation and contract award. This section only applies to bids awarded to the lowest responsive and responsible bidder either by individual bid item or group of bid items and does not include bids which are awarded to all responsive and responsible bidders (i.e. Multiple Award Contracts).

d. **MULTIPLE AWARD CONTRACTS**: Pursuant to Ohio Revised Code 5513.02, the Department may award Contracts to all responsive and responsible bidders for articles (i.e. bid items) meeting the general specifications provided. These are referenced by the Department as 'Multiple Award Contracts'. Unit bid prices submitted for Multiple Award Contracts shall be considered by the Department as an amount-not-to-exceed unit bid price for the entire duration of the Contract. These awarded, amount-not-to-exceed bid prices often do not reflect potential quantity discounts, freight discounts, nor other similar discounts/incentives offered periodically by a distributor, manufacturer, or supplier. Where like or similar bid items are being offered by two or more awarded Vendors (bidders) on the awarded Contract, the Department reserves the right to obtain quotes from all awarded bidders on the Contract in order to achieve the best and most up-to-date pricing available to the Department at the time of ordering.

e. **UNBALANCED BIDS**: The Department will not accept unit bid prices that are deemed to be either materially or mathematically unbalanced. The final determination of an unbalanced unit bid price shall be at the Department's sole discretion.

f. **TIE BID PROCESS**. If two or more responsive bids offer the same unit bid price, ODOT may break the tie as follows: during the bid evaluation process, the bidders that submitted tie bids will be contacted and given up to three (3) business days to submit a written revised unit price for the affected item or items. Bidders are not required to submit a revised unit price. In the event a tie still exists after the above-prescribed deadline has passed, ODOT will schedule a coin flip to be conducted in the presence of both bidders. The winner of the coin flip will be deemed awarded the affected bid item(s).

14. **PREFERENCE FOR OHIO/BORDER STATE PRODUCTS**. The bid award for this invitation to bid may be subject to the domestic preference provisions of the Buy America Act, 41 U.S.C.A., 10a-10d, as amended, and to the preference for Ohio products under O.R.C. Sections 125.09 and 125.11 and Ohio Administrative Code Rule 123:5-1-06. A bidder must complete the enclosed *Buy Ohio/Buy America Certification Statement* form to be eligible to receive any applicable bid preferences.

15. **RESPONSIVE BIDDER**. A bidder is responsive if its bid responds to the bid specifications in all material respects and contains no irregularities or deviations from the specifications that would affect the amount of the bid or otherwise give the bidder an unfair competitive advantage.

16. **MINOR INFORMALITIES OR IRREGULARITIES IN BIDS:** A minor informality or irregularity is one that is merely a matter of form and not of substance. It also pertains to some immaterial defect in a bid or variation of a bid from the exact requirements of the invitation that can be corrected or waived without being prejudicial to other bidders. The defect or variation is immaterial when the effect on price, quantity, quality, or delivery is negligible when contrasted with the total cost or scope of the supplies or services being acquired. The Department either shall give the bidder an opportunity to cure any deficiency resulting from a minor informality or irregularity in a bid or waive the deficiency, whichever is to the advantage of the Department.

17. **BIDDER RESPONSIBILITY**. The Department will only award this invitation to bid to what it deems to be a responsible bidder. The Department's determination of a bidder's responsibility includes, but is not limited to, the following factors:

a) experience of the bidder;
b) bidder's financial condition;
c) bidder's conduct and performance on previous contracts;
d) the bidder's facilities;
e) the bidder's management skills;
f) the bidder's employees;
g) past experience and/or quality of bidder's proposed subcontractors;
h) the bidder's ability to execute the contract;
i) review of Federal and Department debarment lists;
j) bidder has history of successful performance on contracts of similar size and scope; and
k) current or impending legal actions against a bidder.

18. **APPARENT CLERICAL MISTAKES**: Clerical mistakes apparent on the face of the bid may be corrected, at the Department's discretion, before contract award. The Department first shall obtain from the bidder a verification of the information intended and will attach written verification of the mistake by the bidder in the contract file and award documents. Example of apparent clerical mistakes are:

(1) Obvious misplacement of a decimal point or comma;
(2) Obvious incorrect discount factor; or
(3) Transcription error in Part Number.

19. **ADDITIONAL INFORMATION**: The Department reserves the right to request additional information to evaluate a bidder's responsiveness to the Invitation to Bid's requirements and/or to evaluate a bidder's overall responsibility. These requests may require the bidder's submission of confidential materials (e.g. financial statements). If a bidder does not provide all of the requested information within the prescribed timeframe, the Department may find the bid non-responsive and ineligible for award.

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20. **PRODUCT SAMPLES**: The Department may require bidders, by Invitation to Bid or by request during bid evaluation, to provide sample supplies or equipment or examples of work, at the Bidder's expense. Samples must clearly identify the Bidder, the bid number, and the item the sample represents in the bid. The Department will return samples that are not destroyed by testing, at the Bidder's expense, upon the Bidder's timely request. The Department may keep the samples of the Bidder awarded the contract until the completion of the contract. Unsolicited samples submitted in response to this Invitation to Bid will not be evaluated and the Department may dispose of them in any way it chooses.

21. **SPECIFICATIONS:** The Department is authorized by Sections 5513 and/or 125.02(B) of the Ohio Revised Code to prepare specifications and establish contracts to obtain the supplies, equipment, and/or services referenced within this invitation to bid. The purpose of the provided specifications is to describe the supplies, equipment, and/or services to be purchased and will serve as a fair and equitable basis for comparison of submitted bids. The Department may use any form of specification it determines to be in the best interest of the Department and that best describes the supplies or services to be purchased. Specifications may be in the form of a design specification or a combination thereof. If the department determines that a design, performance or a combination specification is not in the best interest of the Department, it may use brand name or equal specifications.

Unless otherwise specified in this Invitation to Bid, all products, equipment, supplies, etc. offered by bidders must be in a new condition. A 'new' product is one that will be first used by the Department after it has been manufactured or produced. Used, reconditioned, or previously titled products, supplies, or equipment will not be considered for award of this Invitation to Bid.

The Department uses qualified products list (QPL) and/or approved products lists (APL) developed by either itself or other qualified institutions to specify acceptable products and supplies that have been through proper application and testing procedures to verify conformance with technical and/or performance specifications. Where the Department requires products and supplies to be included on a specific QPL/APL listing, the Department will not accept bids for products/supplies that are not included on a specified QPL/APL at the time of public bid opening.

A bidder may not be compensated for damages arising from inaccurate or incomplete information in the Invitation to Bid specifications or from inaccurate assumptions based upon the specifications.

22. **USE OF BRAND NAMES**: Unless otherwise provided in this solicitation, the name of a certain brand, make, or manufacturer does not restrict bidders to the specific brand, make, or manufacturer named, but conveys the general style, type, character, and quality of the article desired. Any article which the Department, in its sole discretion, determines to be the equivalent of that specified, considering quality, workmanship, economy of operation, or suitability for the purpose intended, may be accepted. The bidder is responsible to clearly and specifically identify the product being offered and to provide sufficient descriptive literature, catalog cuts and technical detail to enable the Department to determine if the product offered meets the requirements of the solicitation. Failure to furnish adequate data for evaluation purposes may result in declaring a bid nonresponsive. Unless the bidder clearly indicates in its bid that the product being offered is an equivalent product, such bid will be considered to offer the exact brand, make, or manufacturer name referenced in the bid solicitation.

23. **DEVIATIONS**: Statements or modifications made by a bidder in their submitted bid package that deviate from this Invitation to Bid's terms, conditions, specifications and requirements may render a bid non-responsive and ineligible for award.

Acceptance of any deviations or modifications will be confirmed by the Department in writing, if accepted. If the Department does not specifically approve submitted deviations or modifications in writing, an award of this invitation to bid shall not constitute acceptance of the bidder's submitted modifications.

24. **ESTIMATED QUANTITIES**: Any purchase estimates indicated for bid item(s) are to be considered as estimates only. The Department makes no representation or guarantee as to the actual amount of item(s) to be purchased by the Department or Political Subdivisions.

25. **OVERLAPPING CONTRACT ITEMS**: The products and/or services included in this solicitation may be available from other State of Ohio contracts and/or other contracts made available for the Department's use. The existence of these contracts containing like or similar products and/or services could be either known or unknown to the Department at the time this Invitation to bid has been published. Unless otherwise stated in this contract, the Department may acquire these products and/or services from any available source. The Department will make purchases from sources that are deemed to be in the best interest of the Agency.

26. **REJECTION/PARTIAL AWARD OF BIDS**: The Department reserves the right to reject any or all bid responses, award partial contracts, or choose to rebid when:

(1) Product, supplies and/or services are not in compliance with the requirements, specifications, and terms and conditions set forth in this Invitation to Bid; or

(2) Pricing offered is determined to be excessive in comparison with existing market conditions, or exceeds the available funds of the Department; or

(3) Only one bid is received and the Department cannot determine the reasonableness of the bid prices submitted; or

(4) It is determined that the award of any or all items would not be in the best interest of the Department; or

(5) The Department, in its opinion, did not achieve the desired amount of competition amongst qualified bidders for the products, supplies, and/or services being offered in the bid solicitation; or

(6) Inadequate or ambiguous specifications were cited in the bidding documents; or

(7) The Department determines that specifications and/or requirements were missing from the bidding documents; or

(8) A bidder imposes additional terms and conditions against the Department.

27. **NOTICE TO BIDDERS OF REJECTED BIDS:** When the Department deems it necessary to reject a bid, the Department will notify each affected bidder and the reasons for such actions.

28. **BID PROTESTS**: Any bidder either deemed not responsible or whose bid has been deemed non-responsive shall be notified by the Department of that determination and the reasons for it. The notification will be provided by the Department in writing and sent by certified U.S. mail and at the email address provided on the front cover of this bid. The bidder will have five (5) calendar days after receipt (by mail or email confirmation) of this notification to file a written, valid protest of the Department's determination. A valid written protest must contain substantive information and evidence so as to refute the Department's asserted claims against either the bid's responsiveness or bidder's responsibility, whichever apply. The Department will only review and respond to valid written protests containing substantive information and evidence. After review of the valid written protest, the Department will either affirm or reverse its original determination.

If a valid written protest is not received by the Department within five (5) calendar days of receipt, the Director of ODOT will move forward awarding the Contract and the affected bidder will have effectively waived its right to protest the Department's decision. For the purposes of this paragraph, "receipt" shall be defined as verification (via either certified mail return receipt or electronic read or delivery receipt) that the apparent low bidder has received the Department's written determination against the affected bidder. Upon the bidder's receipt, the five (5) calendar day response deadline shall commence.

29. **DELAYS IN CONTRACT AWARD**: Delays in the award of this Invitation to Bid beyond the anticipated Contract start date may result in a change in the contract period as indicated in the Special terms and conditions of this bid solicitation. In these instances ODOT shall reserve the right to award a contract covering a period equal to or less than the initial contract term than originally specified in this bid solicitation.

30. **CONTRACT AWARD AND FORMATION**: Successful bidder(s) will receive via U.S. regular mail and/or email a Notice of Contract Award letter as well as a photocopy version of the Signature Page executed by both Parties. These documents shall serve to form the Contract between the Parties. The Signature Page must be executed by both the bidder and the Director of ODOT for the Contract to be deemed valid and enforceable. The Department will maintain in the Contract file the Signature Page document containing each parties' original signature(s).

Upon award of an Invitation to Bid, the bid invitation number (e.g. Invitation No. 999-16) will subsequently become the number assigned to the resulting Contract (e.g. ODOT Contract number 999-16) and will be referenced by the Department in all matters and documents related to said Contract.

Upon award of an invitation to bid, successful bidders will thereafter be referenced as "Vendor" or "Contractor" by the Department in all matters and documents related to the resulting Contract.

31. **PUBLIC POSTING OF AWARDED CONTRACTS**: All Contracts awarded by the Office of Contract Sales, Purchasing Services section are posted to the Department's website. Successful bidders and awarded Contract pricing can be found by viewing the Contract's award tab (Excel file). Award tabs can be accessed via the following website:

http://www.dot.state.oh.us/Divisions/ContractAdmin/Contracts/Lists/PurchaseCurrentContracts/CurrentKs.aspx

32. **PUBLIC RECORD:** All opened bids and their contents are subject to the Public Records Law, Section 149.43 of the Ohio Revised Code. Copies of bid responses must be requested and will be provided within a reasonable period of time and at a fee established by the Director of ODOT. To expedite and properly respond to such public records requests, a written request must be submitted to the Department. To prevent delays in evaluating bids and awarding contracts, such requests for recently opened bids, will be honored after a Contract has been executed.

Bidders may request that specific information, such as trade secrets or proprietary data, be designated as confidential and not considered as public record. Material so designated shall accompany the bid and be in a sealed container duly marked, and shall be readily separable from the bid in order to facilitate public inspection of non-confidential portion. Prices, makes, models, catalog numbers of items offered, deliveries and terms of payment cannot be considered as confidential. The decision as to whether or not such trade secrets or proprietary data shall be disclosed at the bid opening rests solely with the Department.

Requests to view previously submitted bids must be submitted in writing to either of the following addresses:

Contracts.Purchasing@dot.ohio.gov
Ohio Department of Transportation
Office of Contract Sales, Purchasing Services
1980 West Broad St. Mail Stop 4110
Columbus, OH 43223

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Invitation No. 530-18

State of Ohio, Department of Transportation (ODOT)
Office of Contract Sales, Purchasing Services

GENERAL DEFINITIONS

When used in this Invitation to Bid or any ensuing contract, the following definitions shall apply. If a conflict exists between these definitions and any definition listed in the bid specifications, the bid specifications shall prevail.

1. AGENCY: Ohio Department of Transportation.

2. AUTHORIZED DISTRIBUTOR: The bidder/vendor who maintains written legal agreements with manufacturers/producers to act as their agent and provide supplies, materials, equipment or services listed in the bid/contract. The authorized distributor must maintain active and sufficient facilities necessary to perform the awarded contract, own title to the goods inventoried within these facilities and maintain a true stock of these goods on a continuing basis and in sufficient quantity to provide uninterrupted service to ordering agencies.

3. BIDDER: The company and/or authorized representative of the company who has signed and is submitting a bid response and who will be responsible to ensure proper performance of the contract awarded pursuant to the bid.

4. DEPARTMENT: Ohio Department of Transportation

5. EQUIPMENT: Items, implements and machinery with a predetermined and considerable usage life.

6. F.O.B. PLACE OF DESTINATION: meaning the Vendor pays, and includes the cost of such in their bid, and bears the risk for the transportation/delivery of goods delivered to the specified locations provided by the Purchaser.

7. INVITATION TO BID/CONTRACT: All documents, whether attached or incorporated by reference, utilized for soliciting bids. Upon completion of the evaluation and award of the bidder's response, the Invitation to Bid then becomes the contract between ODOT and the successful bidder, both governed by the laws of the State of Ohio.

8. INVOICE: An itemized listing showing delivery of the commodity or performance of the service described in the order, and the date of the purchase or rendering of the service, or an itemization of the things done, material supplied, or labor furnished, and the sum due pursuant to the contract or obligation.

9. LOWEST RESPONSIVE\RESPONSIBLE BIDDER: A bidder who offers the lowest cost for the goods or services listed in the bid; and whose proposal responds to bid specifications in all material respects and contains no irregularities or deviations from the specifications which would affect the amount of the bid or otherwise give him a competitive advantage; and whose experience, financial condition, conduct and performance on previous contracts, facilities, management skills evidences their ability to execute the contract properly.

10. MINORITY BUSINESS ENTERPRISE (MBE): means an individual, partnership, corporation or joint venture of any kind that is owned and controlled by U. S. Citizens and residents of Ohio, who are and have held themselves out as members of the following socially and economically disadvantaged groups: Blacks, American Indians, Hispanics and Asians. Only businesses certified by the State of Ohio Equal Opportunity Division in accordance with Section 123.151 of the Ohio Revised Code shall be recognized as being MBE certified within the purpose of this invitation.

11. MATERIALS: Items or substance of an expendable or non-expendable nature from which something can be made, improved or repaired.

13. PURCHASE: To buy, purchase, installment purchase, rent, lease, lease purchase or otherwise acquire equipment, materials, supplies or services. "Purchase" also includes all functions that pertain to obtaining of equipment, materials, supplies or services, including description of requirements, selection and solicitation of sources, preparation and award of contracts, and all phases of contract administration.

14. SERVICES: The furnishing of labor, time or effort by a person, not involving the delivery of a specific end product other than a report which, if provided, is merely incidental to the required performance. "Services" does not include services furnished pursuant to employment agreements or collective bargaining agreements.

15. SPECIFICATION: Any description of the physical or functional characteristics or of the nature of supplies, equipment, service, or insurance. It may include a description of any requirements for inspecting, testing, or preparing supplies, equipment, services, or insurance.

16. SUPPLIES: Provisions and items normally considered expendable or consumable.14. UNBALANCED: Any unit price contained in the bid schedule which is obviously unbalanced either above or below reasonable cost analysis and or unreasonably disproportionate to current market prices as determined by the Director of ODOT, or if such unbalanced prices are contrary to the interest of the department.

17. VENDOR: The bidder who, upon awarding of a contract, then becomes a Vendor who is considered to be a primary source for providing the goods and/or services included in the awarded contract and the party to whom payment will be made upon delivery of the goods and/or completion of the contract.

18. SUBVENDOR/SUBCONTRACTOR: An individual, firm or corporation to whom the Vendor sublets part of the contract to be performed.

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Invitation No. 530-18

State of Ohio, Department of Transportation (ODOT)
Office of Contract Sales, Purchasing Services

STANDARD CONTRACT TERMS AND CONDITIONS

(Last Revised 11/2016)

1. **HEADINGS**: The headings used in this Contract are for convenience only and shall not be used to affect the interpretation of any of the Contract terms and conditions.

2. **ENTIRE CONTRACT**: This Contract consists of the complete Invitation to Bid, including the Instructions, Terms and Conditions for Bidding, these Standard Contract Terms and Conditions, the Special Contract Terms and Conditions, ODOT Cooperative Purchasing Program Requirements, mutually executed Signature Page, Specifications and Requirements, awarded unit bid pricing, and any written addenda to the Invitation to Bid; the completed competitive sealed bid, including proper modifications, clarifications and samples; and applicable, valid State of Ohio purchase orders or other ordering documents ("Contract").

3. **APPROPRIATION OF FUNDS**. Pursuant to the Constitution of the State of Ohio, Article II Section 22, ODOT's funds are contingent upon the availability of lawful appropriations by the Ohio General Assembly. If the Ohio General Assembly fails at any time to continue funding for the payments or obligations due hereunder, the Work under this Contract that is affected by the lack of funding will terminate and ODOT will have no further obligation to make any payments and will be released from its obligations on the date funding expires.

   The current Ohio General Assembly cannot commit a future Ohio General Assembly to a future expenditure. If the term of this Contract extends beyond a biennium, the Contract will expire at the end of a current biennium and the State may renew this Contract in the next biennium by issuing written notice to the Contractor no later than July 1 of the new biennium. The operating biennium expires June 30th of each odd-numbered calendar year.

4. **OBM CERTIFICATION**: None of the rights, duties, or obligations in this Contract will be binding on the Department, and the Vendor will not begin its performance, until all of the following conditions have been met:

   1. All statutory provisions under the O.R.C., including Section 126.07, have been met; and
   2. All necessary funds are made available by the Ohio Office of Budget and Management; or
   3. If ODOT is relying on Federal or third-party funds for this Contract the ODOT gives the Vendor written notice that such funds have been made available.

5. **CONTRACT MODIFICATIONS**: Amendments or modifications to this Contract must be executed in writing between the parties and signed by the Director of ODOT. Amendments or modifications to this Contract made between the Vendor and other Department personnel shall be void and unenforceable.

6. **CONTRACT CONSTRUCTION**: Any general rule of construction to the contrary notwithstanding this Contract shall be liberally construed in favor of the effect the purpose of this Contract and the policy and purposes of the Department. If any provisions in this Contract are found to be ambiguous, an interpretation consistent with the purpose of this Contract that would render the provision valid shall be favored over any interpretation that would render it invalid.

7. **GOVERNING LAW / SEVERABILITY**: This Contract shall be governed by the laws of the State of Ohio, and the venue for any disputes will be exclusively with the appropriate court in Franklin County, Ohio. If any provision of the Contract or the application of any provision is held by that court to be contrary to law, the remaining provisions of the Contract will remain in full force and effect.

8. **ASSIGNMENT / DELEGATION**: The Vendor will not assign any of its rights nor delegate any of its duties under this Contract without the written consent of the Director of ODOT. Any assignment or delegation not consented to may be deemed void by the Department.

9. **PLACEMENT OF ORDERS/METHODS OF PAYMENT**: The Department shall use either State of Ohio Purchase Order or State of Ohio Payment Card (i.e. credit card) to authorize performance under this Contract and to issue payments for supplies, products, and/or services acquired. Vendors are required to accept both forms of payment. For Department purchases over $2,500.00, an official State of Ohio purchase order must be generated and obtain approvals from the Office of Budget and Management, the Department of Administrative Services, and the Director of Transportation prior to its effectiveness. An approved State of Ohio purchase order will be sent to the Vendor and the Vendor will provide the goods and/or services listed on the ordering documents and in accordance with the Contract's terms and conditions. Any order placed not using an approved ODOT purchase order or against a State payment card, shall not be considered a valid order and may result in denial of payment and/or return of goods at the Vendor's expense.

10. **ACCEPTANCE OF ORDERS**: The Vendor must accept orders placed by the Department pursuant to this Contract up through the last day of the Contract's effectiveness, inclusive of any contract extensions exercised or agreed-upon between the Parties.

11. **BLANKET PURCHASE ORDERS**: The Department utilizes blanket purchase orders to pre-authorize funding for use on Contracts containing bid items that, due to the urgent nature of maintaining the Department's highways and facilities, are critical to the Department executing its mission and objectives. The generation of blanket purchase orders are not used by the Department to place a specific order, rather as a means to make funding more readily available for use when Contract items are needed. The Vendor shall keep all blanket purchase orders on file and make them readily available for use by Department personnel to place orders against. When placing orders against a blanket purchase order, the Department will telephone or email orders referencing the blanket purchase order and its associated ODOT purchase order number. All of the Contract's terms and conditions shall apply to the Department's orders referencing a blanket purchase order.

    For all blanket purchase orders, quantities and amounts to be purchased from these purchase orders is unknown by the Department and Vendors must not construe these purchase orders as a commitment to purchase a specific amount of goods and/or services. Accordingly, the Department reserves the right to increase or decrease the available funding on these blanket purchase orders at its discretion.

12. **DELIVERY INSPECTION AND ACCEPTANCE**: Upon pick-up or delivery of any supplies, products, and/or services, ODOT retains the right to inspect the product/service prior to final acceptance and/or payment for the product/service. ODOT shall have sufficient and reasonable time to fully inspect supplies and/or services for compliance. The purpose of the inspection process is to ensure that the product/service is in compliance with the specifications set forth in the awarded contract. In the event that the product/service does not meet the specifications, ODOT shall notify the Vendor for removal/replacement of the product and/or service at the Vendor's expense. ODOT shall retain all rights and remedies as described herein. Wherein products ordered by ODOT are delivered to a facility, which is not owned by ODOT and where ODOT has contracted with this facility to take delivery of products ordered by ODOT, acceptance will occur when the products have been inspected and accepted by ODOT within a reasonable amount of time after delivery to the facility. ODOT shall not be responsible for any storage costs incurred prior to the inspection and acceptance.

13. **RETURN GOODS POLICY**: The Department will apply the following Return Goods Policy on all purchases made under the Contract:

    (A) Return goods, when due to Vendor debar (i.e. over-shipment, defective merchandise, unapproved substitution, etc.) shall be returned to the Vendor, at the Vendor's expense. The Vendor shall make arrangements to remove the return goods from the Department's premises within five (5) calendar days after notification. The Vendor shall not apply any restocking or other charges to the Department. At the option of the Department, replacement items may be accepted and will be shipped within five (5) calendar days of notification. Failure of the Vendor to arrange for return of the items within the specified time will result in the items being deemed as abandoned property and the Department will dispose of accordingly.

(B) For orders of custom manufactured items, the Vendor will provide a production sample of the item to the Department for acceptance. The production sample will be identical to the item to be provided. The Department will provide written acceptance of the item prior to the Vendor continuing with production. Once delivery and acceptance has been completed and the Department determines for any reason that any remaining quantities will not be used, the agency may request the return of the custom manufactured items. Acceptance of the return of custom manufactured items will be at the option of the Vendor. If the Vendor agrees to the return of these items, the Department will be responsible for all costs associated with packaging, shipment and transportation, to include the original shipment to the Department and subsequent return of goods to the location designated by the Vendor. The Vendor may assess restocking fees that are equivalent to restocking fees that are normally assessed to other customers or as published by the Vendor. Failure of the Vendor to provide a production sample and obtain written approval from the Department will result in the Vendor bearing all responsibility and costs associated with the return of these goods.

(C) Return goods of regular catalog stock merchandise, when due to Department error (i.e. over purchase, discontinued use, inventory reduction, etc.) will be accepted by the Vendor if notice is given by the Department within six (6) months of delivery and acceptance. All items to be returned must be unused and in their original containers and in suitable condition for resale. The Department will be responsible for all transportation costs associated with both the original shipment of items to the agency and the subsequent return of the items to the location designated by the Vendor. The Vendor may assess a restocking fee (not to exceed 10%) associated with the return of the items to the location designated by the Vendor. Return of regular stock catalog merchandise, when delivery and acceptance exceed six (6) months will be at the option of the Vendor.

14. **PRODUCT RECALLS**: In the event product delivered has been recalled, seized, or embargoed and/or has been determined to be misbranded, adulterated, or found to be unfit for human consumption by the packer, processor, manufacturer or by any Department or Federal regulatory agency, the Vendor shall be responsible to notify the ODOT Office of Contract Sales, Purchasing Services section and all other ordering agencies/entities within two business days after notice has been given. Vendor shall, at the option of the Department, either reimburse the purchase price or provide an equivalent replacement product at no additional cost. Vendor shall be responsible for removal and/or replacement of the affected product within a reasonable time as determined by the ordering agency. At the option of the ordering agency, Vendor may be required to reimburse storage and/or handling fees to be calculated from time of delivery and acceptance to actual removal. Vendor will bear all costs associated with the removal and proper disposal of the affected product. Failure to reimburse the purchase price or provide equivalent replacement product will be considered a default.

15. **PRODUCT SUBSTITUTION**: In the event a specified product listed in the Contract becomes unavailable or cannot be supplied by the Vendor for any reason (except as provided for in the Force Majeure clause), a product deemed in writing by the Department to be equal to or better than the specified product must be substituted by the Vendor at no additional cost or expense to the Department. Unless otherwise specified, any substitution of product prior to the Department's written approval may be cause for termination of Contract.

The Department reserves the right to deny any substitution request that it is deemed to not be in the best interest of the Department. In these instances, the Department may seek substitute products from another supplier and assess the difference in cost, if any, as damages against the Vendor for their material breach.

16. **INVOICE REQUIREMENTS**: The Vendor must submit an original, proper invoice to the office designated on the purchase order as the "bill to" address. To be a proper invoice, the invoice must include the following information: 1. The ODOT purchase order number authorizing the delivery of products or services. 2. A description of what the Vendor delivered, including, as applicable, the time period, serial number, unit price, quantity, and total price of the products and services. 3. The Contract number pursuant to the deliverable.

17. **DEFECTIVE INVOICES**: In the event the Department is in receipt of defective or improper invoices, the Department shall postpone payment pursuant to Section 126.30 of the Ohio Revised Code. Invoices shall be returned to the Vendor noting areas for correction. If such notification of defect is sent, the required payment date shall be thirty (30) calendar days after receipt of the corrected invoice.

18. **PAYMENT DUE DATE**: Payments under this Contract will be due on the 30th calendar day after the date of actual receipt of a proper invoice in the office designated to receive the invoice, or the date the service is delivered and accepted in accordance with the terms of this Contract. The date of the warrant issued in payment will be considered the date payment is made. Interest on late payments will be paid in accordance with O.R.C. Section 126.30.

19. **INSURANCE POLICIES**: By way of provision in this Contract to maintain specific minimum levels of insurance coverage(s) (e.g. Commercial General liability, Auto liability, Public liability, Property Damage, etc.), the Vendor shall provide to Department upon request evidence of such insurance required to be carried by these provisions, including any endorsement affecting the additional insured status, is in full force and effect and that premiums therefore have been paid. Such evidence shall be furnished by the Vendor within two (2) business days and on the insurance industry's standard ACORD Form (Certificate of Insurance) or a certified copy of the original policy. The Certificate of Insurance or certified copy of the policy must contain an endorsement naming the State of Ohio, Department of Transportation, its officers, agents, employees, and servants as additionally insured, but only with respect to Work performed for the Department under this Contract, at no cost to Department. Vendor shall notify the Department within ten (10) calendar days of receipt of a notice of cancellation, expiration, or any reduction in coverage, or if the insurer commences proceedings or has proceedings commenced against it, indicating the insurer is insolvent. Vendor shall provide to the Department evidence of a replacement policy at least five (5) calendar days prior to the effective date of such cancellation, expiration, or reduction in coverage.

    All required insurance policies shall be maintained at Vendor's sole expense and in full force for the complete term of the Contract, including any warranty periods. Reference 107.12 the Construction & Materials Specification handbook.

20. **TAXATION**: ODOT is exempt from federal excise taxes and all Department and local taxes, unless otherwise provided herein. ODOT does not agree to pay any taxes on commodities, goods, or services acquired from any Vendor.

21. **CONTRACT TERMINATION**: If a Vendor fails to perform any one of its obligations under this Contract, it will be in breach of contract and the Department may terminate this Contract in accordance with this section. Notices of contract termination shall be made in writing. The termination will be effective on the date delineated by the Department.

    a. **Termination for Breach**. If Vendor's breach is unable to be cured in a reasonable time, the Department may terminate the Contract by written notice to the Vendor.

    b. **Termination for Un-remedied Breach**. If Vendor's breach may be cured within a reasonable time, the Department will provide written notice to Vendor specifying the breach and the time within which Vendor must correct the breach. If Vendor fails to cure the specified breach within the time required, the Department may terminate the Contract. If the Department does not give timely notice of breach to Vendor, the Department has not waived any of the Department's rights or remedies concerning the breach.

    c. **Termination for Persistent Breach**. The Department may terminate this Contract by written notice to Vendor for defaults that are cured, but are persistent. "Persistent" means three or more breaches. After the Department has notified Vendor of its third breach, the Department may terminate this Contract without providing Vendor with an opportunity to cure. The three or more breaches are not required to be related to each other in any way.

    d. **Termination for Endangered Performance**. The Department may terminate this Contract by written notice to the Vendor if the Department determines that the performance of the Contract is endangered through no fault of the Department.

e. **Termination for Financial Instability**. The Department may terminate this Contract by written notice to the Vendor if a petition in bankruptcy or a Federal or State tax lien has been filed by or against the Vendor.

f. **Termination for Delinquency, Violation of Law**. The Department may terminate this Contract by written notice, if it determines that Vendor is delinquent in its payment of federal, Department or local taxes, workers' compensation insurance premiums, unemployment compensation contributions, child support, court costs or any other obligation owed to a Department agency or political subdivision. The Department also may cancel this Contract, if it determines that Vendor has violated any law during the performance of this Contract. However, the Department may not terminate this Contract if the Vendor has entered into a repayment agreement with which the Vendor is current.

g. **Termination for Subcontractor Breach**. The Department may terminate this Contract for the breach of the Vendor or any of its subcontractors. The Vendor will be solely responsible for satisfying any claims of its subcontractors for any suspension or termination and will indemnify the Department for any liability to them. Subcontractors will hold the Department harmless for any damage caused to them from a suspension or termination. The subcontractors will look solely to the Vendor for any compensation to which they may be entitled.

h. **Termination for Vendor's Failure to Pay Material Suppliers**. Pursuant to Section 4113.61 of the Ohio Revised Code, Vendors shall promptly pay material suppliers, within ten (10) calendar days of receipt of payment from the State of Ohio, for materials ordered and delivered as a result of this contract. A Vendor unable to furnish bid items because of non-payment issues related to a material supplier shall constitute grounds for the Director of ODOT to terminate this contract immediately. A Vendor may, at the discretion of the Department, be given an amount of time, amount shall be specified by the Department in writing, to furnish past due payment to the material supplier before termination shall occur.

j. **Failure to Maintain MBE Certification.** Pursuant to O.R.C. Section 125.081, the State may set aside a bid for supplies or services for participation only by minority business enterprises (MBE's) certified by the State of Ohio, Equal Opportunity Coordinator. After award of the Contract, it is the responsibility of the MBE Contractor to maintain certification as a MBE. If the Contractor fails to renew its certification and/or is decertified by the State of Ohio, Equal Opportunity Coordinator, the State may immediately cancel the Contract.

k. **Failure to Maintain Licensure**. The Vendor's failure to maintain the proper license(s) to perform the services or provide the goods prescribed by this Contract shall be grounds to terminate this Contract without prior notice.

l. **Qualified Products Listing and Approved Products Listing**. Any products or supplies removed from a specific qualified products listing/approved products listing, by either the Department, government, or governing body throughout the duration of the Contract shall be removed from the Contract effective on the date of removal from the respective listing.

22. **NOTICE OF BREACH**: Each party of this Contract has an obligation to provide written notice when it is determined by one party that the other party is in default of this Contract. A notice of ODOT's default of this Contract must be sent to the Procurement Manager of the ODOT Office of Contract Sales.

23. **CONTRACT SUSPENSION**: A Vendor who fails to perform any one of its obligations under this Contract will be in breach. In these instances, ODOT may choose to suspend the Vendor from the contract rather than terminate the Contract.

In the case of a suspension for ODOT's convenience, the amount of compensation due the Vendor for work performed before the suspension will be determined in the same manner as provided in this section for termination for ODOT's convenience or the Vendor may be entitled to compensation for work performed before the suspension, less any damage to ODOT resulting from the Vendor's breach of this Contract or other fault.

The notice of suspension, whether with or without cause, will be effective immediately on the Vendor's receipt of the notice. The Vendor will immediately prepare a report and deliver it to ODOT which will include a detailed description of work completed, percentage of project completion, estimated time for delivery of all orders received to date, and costs incurred by the Vendor.

24. **CANCELLATION FOR CONVENIENCE**: The Department reserves the right to cancel and terminate this Contract, in whole or in part, without penalty, upon thirty (30) days written notice to an awarded vendor. In the event the initial contract period is for more than 12 months, the resulting contract may be terminated by either party, without penalty, after the initial 12 months of the contract period and upon a minimum of sixty (60) days written notice to the other party. Cancellations exercised in accordance with this section shall not relieve the Vendor of the obligation to deliver and/or perform on all outstanding orders issued prior to the effective date of cancellation.

25. **CONTRACT DAMAGES**: The Department may assess, at a minimum but not limited to, the following damages against a Vendor:

A. **ACTUAL DAMAGES**: Vendor is liable to the State of Ohio for all actual and direct damages caused by Vendor's breach. The Department may substitute supplies or services, from a third party, for those that were to be provided by Vendor. In accordance with Ohio Revised Code §5513.05(c), the Department may recover the costs associated with acquiring substitute supplies or services, less any expenses or costs saved by Vendor's breach, from Vendor.

B. **LIQUIDATED DAMAGES**: If actual and direct damages are uncertain or difficult to determine, the Department may recover liquidated damages in the amount of 1% of the value of the order, deliverable or milestone that is the subject of the breach for every day that the breach is not cured by the Vendor. If Delay of the cure is caused by ODOT, the delivery date shall be extended accordingly to offset such delays. Approval to extend any scheduled delivery date(s) shall be at the sole discretion of ODOT.

C. **DEDUCTION OF DAMAGES FROM CONTRACT PRICE**: The Department may deduct all or any part of the damages resulting from Vendor's breach from any part of the price still due on the contract, upon prior written notice issued to the Vendor by the Department.

D. **INCIDENTAL/CONSEQUENTIAL DAMAGES:** Pursuant to Section 5513.05 of the Ohio Revised Code, the Department may recover from a Vendor who fails to promptly provide conforming articles, any incidental or consequential damages as defined in Section 1302.89 of the Ohio Revised Code, incurred by the Department in promptly obtaining the conforming articles.

26. **CONTRACT TERM EXTENSIONS:** ODOT reserves the right to unilaterally extend this Contract up to one (1) calendar month beyond the original contract expiration date at the original unit bid prices awarded. Contract extensions beyond one (1) calendar month shall be executed by means of written, mutual agreement with the Contract Vendor.

27. **FIRM, FIXED PRICE CONTRACT**: Unless otherwise specified in the bidding documents, this Contract is a Firm, Fixed-Price Contract. The Vendor will be required to provide to the Department with the materials, supplies, equipment and/or services at the awarded bid price(s) for the entire duration of the contract, and any extensions thereto.

28. **FORCE MAJEURE**: If the Department or Vendor is unable to perform any part of its obligations under this Contract by reason of force majeure, the party will be excused from its obligations, to the extent that its performance is prevented by force majeure, for the duration of the event. The party must remedy with all reasonable dispatch the cause preventing it from carrying out its obligations under this Contract. The term "force majeure" means without limitation: acts of God; such as epidemics; lightning; earthquakes; fires; storms; hurricanes; tornadoes; floods; washouts; droughts; any other severe weather; explosions; restraint of government and people; war; labor strikes; and other like events.

29. **EQUAL EMPLOYMENT OPPORTUNITY**: The Vendor will comply with all Department and federal laws regarding equal employment opportunity, including O.R.C. Section 125.111 and all related Executive Orders.

30. **ANTITRUST ASSIGNMENT TO THE DEPARTMENT**: Vendor assigns to the State of Ohio, through the Department of Transportation, all of its rights to any claims and causes of action the Vendor now has or may acquire under Department or federal antitrust laws if the claims or causes of action relate to the supplies or services provided under this Contract. Additionally, the State of Ohio will not pay excess charges resulting from antitrust violations by Vendor's suppliers and subcontractors.

31. **CONFIDENTIALITY**: The Vendor may learn of information, documents, data, records, or other material that is confidential in the performance of this Contract. The Vendor may not disclose any information obtained by it as a result of this Contract, without the written permission of the Department. The Vendor must assume that all Department information, documents, data, records or other material is confidential.

The Vendor's obligation to maintain the confidentiality of the information will not apply where it: (1) was already in the Vendor's possession before disclosure by the Department, and it was received by the Vendor without the obligation of confidence; (2) is independently developed by the Vendor; (3) is or becomes publicly available without breach of this Contract; (4) is rightfully received by the Vendor from a third party without an obligation of confidence; (5) is disclosed by the Vendor with the written consent of the Department; or (6) is released in accordance with a valid order of a court or governmental agency, provided that the Vendor (a) notifies the Department of such order immediately upon receipt of the order and (b) makes a reasonable effort to obtain a protective order from the issuing court or agency limiting disclosure and use of the confidential information solely for the purposes intended to be serviced by the original order of production. The Vendor will return all originals of any information and destroy any copies it has made on termination or expiration of this Contract.

The Vendor will be liable for the disclosure of any confidential information. The parties agree that the disclosure of confidential information of the Department's may cause the Department irreparable damage for which remedies other than injunctive relief may be inadequate, and the Vendor agrees that in the event of a breach of the obligations hereunder, the Department shall be entitled to temporary and permanent injunctive relief to enforce this provision without the necessity of providing actual damages. This provision shall not, however, diminish or alter any right to claim and recover.

32. **DRUG-FREE WORKPLACE**: The Vendor agrees to comply with all applicable Department and federal laws regarding drug-free workplace and shall make a good faith effort to ensure that all its employees, while working on Department property, will not purchase, transfer, use or possess illegal drugs or alcohol or abuse prescription drugs in any way.

33. **WORKERS' COMPENSATION**: Workers' compensation insurance, as required by Ohio law or the laws of any other Department where work under this Contract will be done. The Vendor will also maintain employer's liability insurance with at least a $1,000,000.00 limit.

34. **OHIO ETHICS LAW**: Vendor agrees that it is currently in compliance and will continue to adhere to the requirements of Ohio Ethics law as provided by Section 102.03 and 102.04 of the Ohio Revised Code.

35. **PUBLICITY**: The Vendor will not advertise that it is doing business with the Department or use this Contract as a marketing or sales tool without prior, written consent of the Department. This provision includes marketing or sales tools related to the ODOT Cooperative Purchasing Program.

36. **STRICT PERFORMANCE**: The failure of either party, at any time to demand strict performance by the other party of any of the terms of this Contract, will not be construed as a waiver of any such term and either party may at any time demand strict and complete performance by the other party.

37. **SUBCONTRACTING**. The Department recognizes that it may be necessary for the Vendor to use subcontractors to perform portions of the work under the Contract. In those circumstances, the Vendor shall submit a list identifying its subcontractors or joint venture partners performing portions of the work under the Contract. If any changes occur during the term of the Contract, the Vendor shall supplement its list of subcontractors or joint venture business partners. In addition, all subcontractors or joint venture business partners agree to be bound by all of the Terms and Conditions and specifications of the Contract. The Department reserves the right to reject any subcontractor submitted by the Vendor. All subcontracts will be at the sole expense of the Vendor and the Vendor will be solely responsible for payment of its subcontractors. The Vendor assumes responsibility for all sub-contracting and third party manufacturer work performed under the Contract. In addition, Vendor will cause all subcontractors to be bound by all of the Terms and Conditions and specifications of the Contract. The Vendor will be the sole point of contact with regard to all contractual matters.

38. **SURVIVORSHIP**: All sections herein relating to payment, confidentiality, license and ownership, indemnification, publicity, construction warranties, limitations of warranties and limitations on damages shall survive the termination of this Contract.

39. **GENERAL REPRESENTATIONS AND WARRANTIES**: The Vendor warrants that the recommendations, guidance, and performance of the Vendor under this Contract will:

1. Be in accordance with the sound professional standards and the requirements of this Contract and without any material defect.

2. No services, products or supplies will infringe on the intellectual property rights of any third party.

3. All warranties are in accordance with Vendor's standard business practices attached.

4. That the products or supplies hereunder are merchantable and fit for the particular purpose described in this contract. Additionally, with respect to the Vendor's activities under this Contract, the Vendor warrants that:

5. The Vendor has the right to enter into this Contract.

6. The Vendor has not entered into any other contracts or employment relationships that restrict the Vendor's ability to perform under this Contract.

7. The Vendor will observe and abide by all applicable laws and regulations, including those of the Department regarding conduct on any premises under the Department's control.

8. The Vendor has good and marketable title to any products or supplies delivered under this Contract and which title passes to the Department.

9. The Vendor has the right and ability to grant the license granted in products or supplies in which title does not pass to the Department. If any services of the Vendor or any products or supplies fails to comply with these warranties, and the Vendor is so notified in writing, the Vendor will correct such failure with all due speed or will refund the amount of the compensation paid for the services, products or supplies. The Vendor will also indemnify the Department for any direct damages and claims by third parties based on breach of these warranties.

40. **VENDOR'S WARRANTY AGAINST AN UNRESOLVED FINDING FOR RECOVERY**: Vendor warrants that it is not subject to an unresolved finding for recovery under O.R.C. Section 9.24. If the warranty was false on the date the parties signed this Contract, the Contract is void ab initio.

41. **LIMITATION OF LIABILITY**: Notwithstanding any limitation provisions contained in the documents and materials incorporated by reference into this contract, the Vendor agrees that the Vendor shall be liable for all direct damages due to the fault or negligence of the Vendor.

42. **INDEMNITY**: The Vendor will indemnify the Department for any and all claims, damages, lawsuits, costs, judgments, expenses, and any other liabilities resulting from bodily injury to any person (including injury resulting in death) or damage to property that may arise out of or are related to Vendor's performance under this Contract, providing such bodily injury or property damage is due to the negligence of the Vendor, its employees, agents, or subcontractors. Reference 107.12 the Construction & Materials Specification handbook.

The Vendor will also indemnify the Department against any claim of infringement of a copyright, patent, trade secret, or similar intellectual property rights based on the Department's proper use of any products or supplies under this Contract. This obligation of indemnification will not apply where the Department has modified or misused the products or supplies and the claim of infringement, is based on the modification or misuse. The Department agrees to give the Vendor notice of any such claim as soon as reasonably practicable and to give the Vendor the authority to settle or otherwise defend any such claim upon consultation with and approval by the Office of the Department Attorney General. If a successful claim of infringement is made, or if the Vendor reasonably believes that an infringement claim that is pending may actually succeed, the Vendor will take one (1) of the following four (4) actions:

1. Modify the products or supplies so that is no longer infringing;
2. Replace products or supplies with an equivalent or better item;
3. Acquire the right for the Department to use the infringing products or supplies as it was intended for the Department to use under this Contract; or
4. Remove the products or supplies and refund the fee the Department paid for the products or supplies and the fee for any other products or supplies that required the availability of the infringing products or supplies for it to be useful to the Department.

43. **AUDITS**: The Vendor must keep all financial records in a manner consistent with generally accepted accounting principles. Additionally, the Vendor must keep separate business records for this Contract, including records of disbursements and obligations incurred that must be supported by contracts, invoices, vouchers and other data as appropriate. During the period covered by this Contract and until the expiration of three (3) years after final payment under this Contract, the Vendor agrees to provide the Department, its duly authorized representatives or any person, agency or instrumentality providing financial support to the work undertaken hereunder, with access to and the right to examine any books, documents, papers and records of the Vendor involving transactions related to this Contract. The Vendor shall, for each subcontract in excess of two thousand five hundred ($2,500), require its subcontractor to agree to the same provisions of this Article. The Vendor may not artificially divide contracts with its subcontractors to avoid requiring subcontractors to agree to this provision. The Vendor must provide access to the requested records no later than (5) five business days after the request by the Department or any party with audit rights. If an audit reveals any material deviation from the Contract requirements, and misrepresentations or any overcharge to the Department or any other provider of funds for the Contract, the Department or other party will be entitled to recover damages, as well as the cost of the audit.

44. **INDEPENDENT CONTRACTOR ACKNOWLEDGEMENT**: It is fully understood and agreed that Vendor is an independent contractor and is not an agent, servant, or employee of the State of Ohio or the Ohio Department of Transportation. Vendor declares that it is engaged as an independent business and has complied with all applicable federal, state, and local laws regarding business permits and licenses of any kind, including but not limited to any insurance coverage, workers' compensation, or unemployment compensation that is required in the normal course of business and will assume all responsibility for any federal, state, municipal or other tax liabilities. Additionally, Vendor understands that as an independent contractor, it is not a public employee and is not entitled to contributions from the State to any public employee retirement system.

45. **EXECUTIVE ORDER 2011-12K**: The Vendor affirms to have read and understands Executive Order 2011-12K issued by Ohio Governor John R. Kasich and shall abide by those requirements in the performance of this Contract and shall perform no services required under this Contract outside of the United States of America. The Executive Order is incorporated by reference and also is available at the following website: (http://www.governor.ohio.gov/Portals/0/pdf/executiveOrders/EO%202011-12K.pdf).

The Vendor also affirms, understands, and agrees to immediately notify the Department of any change or shift in the location(s) of services performed by the Vendor or its subcontractors under this Contract, and no services shall be changed or shifted to a location(s) that are outside of the United States of America.

46. **CONTRACTOR DISCLOSURE; LOCATION OF SERVICES, DATA**: As part of this Contract, Contractor shall disclose the following: 1. The location (s) where all services will be performed; and 2. The location(s) where any state data applicable to the contract will be maintained or made available; and 3. The principal location of business for the contractor and all subcontractors. Contractor shall not, during the performance of this Contract, change the location(s) of the country where the services are performed or change the location(s) of the country where the data is maintained or made available without prior written approval of the State.

47. **DAMAGES FOR SERVICES PERFORMED OUTSIDE OF THE UNITED STATES**: The Department is not obligated and shall not pay for any services provided under this Contract that the Vendor or any of its subcontractors performed outside of the United States of America. If services are performed outside of the United Departments, this will be treated as a material breach of the Contract, and Vendor shall immediately return to the Department all funds paid for those services. This requirement includes data warehousing and storage. All electronic data must reside in the United States.

In addition, if the Vendor or any of its subcontractors perform any such services outside of the United Departments, the Department may, at any time after the breach, terminate this Contract for such breach, upon written notice to the Vendor. If the Department terminates the Contract, the Department may buy substitute services from a third party, and the Department may recover the additional costs associated with acquiring the substitute services.

If the Vendor or any of its subcontractors prepares to perform services, changes or shifts the location(s) of services performed by the Vendor or its subcontractors under this Contract to a location(s) outside of the United Departments, but no services are actually performed, the Vendor has 30 days to change or shift the location(s) of services performed to location(s) within the United Departments. The Department may recover liquidated damages in the amount of 5 % of the value of the contract for every day past the time permitted to change or shift the location(s).

48. **NON-DISCRIMINATION/COMPLIANCE WITH APPLICABLE LAWS:** During the performance of this contract, the contractor, for itself, its assignees, and successors in interest (hereinafter referred to as the "contractor") agrees as follows:

Compliance with Regulations: The contractor (hereinafter includes consultants) will comply with the Acts and Regulations relative to Non-discrimination in Federally-assisted programs of the U.S. Department of Transportation, Federal Highway Administration (FHWA), as they may be amended from time to time, which are herein incorporated by reference and made a part of this contract.

Non-discrimination: The Vendor, with regard to the work performed by it during the contract, will not discriminate on the grounds of race, color, national origin, sex, age, disability, low-income status, or limited English proficiency in the selection and retention of subcontractors, including procurements of materials and leases of equipment. The Vendor will not participate directly or indirectly in the discrimination prohibited by the Acts and the Regulations as set forth in Appendix E below, including employment practices when the contract covers any activity, project, or program set forth in Appendix B of 49 CFR Part 21.

Solicitations for Subcontractors, including Procurements of Materials and Equipment: In all solicitations, either by competitive bidding, or negotiation made by the Vendor for work to be performed under a subcontract, including procurements of materials, or leases of equipment, each potential subcontractor or supplier will be notified by the Vendor of the Vendor's obligations under this contract and the Acts and the Regulations relative to nondiscrimination on the grounds of race, color, national origin, sex, age, disability, low-income status, or limited English proficiency.

Information and Reports: The Vendor will provide all information and reports required by the Acts, the Regulations, and directives issued pursuant thereto, and will permit access to its books, records, accounts, other sources of information, and its facilities as may be determined by the Ohio Department of Transportation (hereinafter "ODOT") or FHWA to be pertinent to ascertain compliance with such Acts, Regulations, and instructions. Where any information required of a Vendor is in the exclusive possession of another who fails or refuses to furnish this information, the Vendor will so certify to ODOT or FHWA, as appropriate, and will set forth what efforts it has made to obtain the information.

Sanctions for Noncompliance: In the event of a Vendor's noncompliance with the Nondiscrimination provisions of this contract, ODOT will impose such contract sanctions as it or FHWA may determine to be appropriate, including, but not limited to:

a. Withholding payments to the Vendor under the contract until the Vendor complies; and/or
b. Cancelling, terminating, or suspending a control, in whole or in part.

Incorporation of Provisions: The Vendor will include the provisions of paragraphs one through six in every subcontract, including procurements of materials and leases of equipment, unless exempt by the Acts, the Regulations, and directives issued pursuant thereto. The Vendor will take action with respect to any subcontract or procurement as ODOT or FHWA may direct as a means of enforcing such provisions including sanctions for noncompliance. Provided, that if the Vendor becomes involved in, or is threatened with litigation by a subcontractor, or supplier because of such direction, the Vendor may request ODOT to enter into any litigation to protect the interests of ODOT. In addition, the Vendor may request the United States to enter into the litigation to protect the interests of the United States.

During the performance of this contact, the Vendor, for itself, its assignees, and successors in interest (hereinafter referred to as the "Vendor," which includes consultants) agrees to comply with the following non-discrimination statutes and authorities; including but not limited to:

APPENDIX E: Pertinent Non-Discrimination Authorities:

- Title VI of the Civil Rights Act of 1964 (42 U.S.C. § 2000d *et seq.*, 78 stat. 252) (prohibits discrimination on the basis of race, color, national origin); and 49 CFR Part 21
- The Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (42 U.S.C. § 4601) (prohibits unfair treatment of persons displaced or whose property has been acquired because of Federal or Federal-Aid programs and projects)
- Federal-Aid Highway Act of 1973 (23 U.S.C. § 324 *et seq.*) (prohibits discrimination on the basis of sex)
- Section 504 of the Rehabilitation Act of 1973 (29 U.S.C. § 794 *et seq.*), as amended (prohibits discrimination on the basis of disability) and 49 CFR Part 27
- The Age Discrimination Act of 1975, as amended (42 U.S.C. § 6101 *et seq.*) (prohibits discrimination on the basis of age)
- Airport and Airway Improvement Act of 1982 (49 U.S.C. § 471, Section 47123), as amended (prohibits discrimination based on race, creed, color, national origin, or sex)
- The Civil Rights Restoration Act of 1987 (PL 100-209) (broadened the scope, coverage, and applicability of Title VI of the Civil Rights Act of 1964, the Age Discrimination Act of 1975, and Section 504 of the Rehabilitation Act of 1973, by expanding the definition of the terms "programs or activities" to include all of the programs or activities of Federal-Aid recipients, sub-recipients, and Vendors, whether such programs or activities are Federally funded or not)

- Titles II and III of the Americans with Disabilities Act (42 U.S.C. §§ 12131-12189), as implemented by Department of Transportation regulations at 49 CFR parts 37 and 38 (prohibits discrimination on the basis of disability in the operation of public entities, public and private transportation systems, places of public accommodation, and certain testing entities)
- The Federal Aviation Administration's Non-Discrimination Statute (49 U.S.C. § 47123) (prohibits discrimination on the basis of race, color, national origin, and sex)
- Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations (ensures non-discrimination against minority populations by discouraging programs, policies, and activities with disproportionately high and adverse human health or environmental effects on minority and low-income populations)
- Executive Order 13166, Improving Access to Services for People with Limited English Proficiency, and resulting agency guidance, national origin discrimination includes discrimination because of limited English proficiency (LEP). To ensure compliance with Title VI, you must take reasonable steps to ensure that LEP persons have meaningful access to your programs (70 Fed. Reg. at 74087 to 74100)
- Title VIII of the Civil Rights Act of 1968 (Fair Housing Act), as amended (prohibits discrimination in the sale, rental, and financing of dwellings on the basis of race, color, religion, sex, national origin, disability, or familial status (presence of child under the age of 18 and pregnant women)
- Title IX of the Education Amendments Act of 1972, as amended (20 U.S.C. 1681 *et seq.*) (prohibits discrimination on the basis of sex in education programs or activities)

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Invitation No. 530-18

DISTRICT MAP

OHIO DEPARTMENT OF TRANSPORTATION

DISTRICT INFORMATION

District	District Deputy Director, District Address	Main Telephone No.
1	1885 N. McCullough, Lima, Ohio 45801	419-222-9055
2	317 East Poe Road, Bowling Green, Ohio 43402	419-353-8131
3	906 North Clark St., Ashland, Ohio 44805	419-281-0513
4	2088 S. Arlington Rd., Akron, Ohio 44306	330-786-3100
5	9600 Jacksontown Road, P.O. Box 306, Jacksontown, Ohio 43030	740-323-4400
6	400 East Williams St., Delaware, Ohio 43015	740-363-1251
7	1001 St. Mary's Ave, Sidney, Ohio 45365	937-492-1141
8	505 South State Rt. 741, Lebanon, Ohio 45036	513-932-3030
9	650 Eastern Ave., P.O. Box 467, Chillicothe, Ohio 45601	740-773-2691
10	338 Muskingum Drive, Marietta, Ohio 45750	740-373-0212
11	2201 Reiser Ave SE, New Philadelphia, Ohio 44663	330-339-6633
12	5500 Transportation Boulevard, Garfield Heights, Ohio 44125-5396 Mail: Box 258003, Garfield Heights, Ohio 44125-8003	216-581-2100

168 Practices on Acquiring Proprietary Data for Transportation Applications

Invitation No. 530-18

State of Ohio, Department of Transportation (ODOT)
Office of Contract Sales, Purchasing Services

SIGNATURE PAGE

Invitation to Bid #530-18
Commodity/Service: Origin Destination Data Service

This Signature Page must be completed and submitted with a Bidder's sealed bid package to serve as acknowledgement to the Department that the Bidder understands and will comply with all terms, conditions, and requirements in submitting a bid (offer) for the above-referenced Invitation to Bid.

Furthermore, the execution and submission of this Signature Page shall serve as acknowledgment that the Bidder will enter into a Contract with the State of Ohio, Department of Transportation if selected for award of the above-referenced Invitation to Bid, and understands, upon Contract award, it shall be bound by all terms and conditions included in this invitation to bid.

The person signing and executing this Signature Page below acknowledges that he/she is signing on behalf of their Company in a representative capacity and hereby warrants that he/she has been duly authorized by his/her Company to submit this formal bid (offer) and is authorized to execute Contracts on such Company's behalf.

(Please execute below using blue ink)

Company (Bidder) Name: _____

Original Signature: _____

Print Name of Officer: _____

Title of Signing Officer: _____

Date: _____

FOR USE BY THE OHIO DEPARTMENT OF TRANSPORTATION ONLY:

Pursuant to Section 30 of the Instructions, Terms and Conditions for Bidding, a signature below by the Director of ODOT shall serve as the Department's formal acceptance of the bidder's offer and will effectively form ODOT Contract 530-18 between the State of Ohio, Department of Transportation and the above successful bidder (company):

_____ _____
Thomas Pannett, P.E., Esq. **Date**
Administrator, Office of Contract Sales
State of Ohio, Department of Transportation

_____ _____
Jerry Wray **Date**
Director
State of Ohio, Department of Transportation

APPENDIX D4 ARIZONA DOT TRAFFIC DATA RFP

ADOT Procurement

STATE OF ARIZONA
ARIZONA DEPARTMENT OF TRANSPORTATION
1739 W. Jackson St., Ste. A
Phoenix, AZ 85007

REQUEST FOR PROPOSAL

SOLICITATION NUMBER: ADOT17-00007285

DESCRIPTION: Intelligent Transportation System Third Party Vehicle Traffic Data Provider

QUESTIONS: Inquiries regarding the solicitation are to be submitted online through ProcureAZ using the Q&A Tab.

OFFERORS ARE STRONGLY ENCOURAGED TO READ THE ENTIRE SOLICITATION.

Amir Sakhi
Procurement Officer
Phone: (602) 712-4398
Email: asakhi@azdot.gov

This solicitation is issued in accordance with A.R.S. §41-2534 and A.C.C. R2-7-C301 et seq., Competitive Sealed Proposals.

"An Equal Opportunity Agency"

The Arizona Department of Transportation, in accordance with the provisions of Title VI of the Civil Rights Act of 1964 (78 Stat. 252.42 U.S.C. §§ 2000d-4) and the Regulations, hereby notifies all bidders that it will affirmatively ensure that any contract entered into pursuant to this advertisement, disadvantaged business enterprises will be afforded full and fair opportunity to submit bids in response to this invitation and will not be discriminated against on the grounds of race, color, or national origin in consideration for an award

Rev. 08/2015

ADOT Procurement

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ADOT Procurement

SCOPE OF WORK

1. Statement of Need

1.1. Pursuant to the Provisions of the Arizona Procurement Code, A.R.S. §41-2501 et seq., The Arizona Department of Transportation (ADOT), on behalf of the State of Arizona (hereinafter referred to as the Department), including all political subdivisions; cities and counties, is seeking qualified firms, hereinafter referred to as the Contractor, to provide intelligent transportation system (ITS), traffic data (third party vehicle probe data).

1.2. The Department's need for data, analytics, and associated services is evolving.

1.3. The service requirement includes all state routes, U.S. routes, freeway sections, local routes and arterials within the state.

1.4. The Contractor (data provider) shall not install any data collection equipment on agency right of way.

1.5. Primary Objectives

1.5.1. The ability to provide traveler information along all state routes, US routes, freeway sections, local routes and arterials.

1.5.2. The ability to archive and obtain historical data to depict trends in traffic throughout regions and corridors in order to determine where and how to best implement improvements to the roadway systems.

1.5.3. The ability to derive and use traffic volumes for tracking volume changes over time. The traffic volume changes can be used to evaluate changes made to the roadway systems by comparing before and after volumes.

1.5.4. The ability to use traffic data to report performance and support freeways and arterial traffic operations including addressing gaps in existing detection.

1.5.5. Act as an enhancement to the existing forms of statewide and regional traffic data to support local, state and federal advanced transportation and congestion management technologies deployment (ATCDM) initiatives. The obtained traffic data would be integrated with other data sources such as the National Performance Management Research Data Set (NPMRDS) from FHWA, Freeway Management System (FMS) data, Phoenix Fire Computer Aided Dispatch, Anonymous Re-Identification (ARID) data, and other state, city, and county government agency data. The data is incorporated into RADS and shared with AZ511, Dynamic Message Signs, In-Vehicle Systems, and other eligible parties to view the data.

2. Introduction and Background

2.1 As lead agencies in Traffic Management and Operations partnership, the Department and Maricopa County Department of Transportation (MCDOT) have entered into an

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intergovernmental agreement seeking to establish an on call contract to provide traffic data and to perform variety of different services and information as it relates to traffic data statewide. The selected Contractors shall then be available to all Jurisdictions within the State of Arizona requesting traffic data services utilizing federal, state, city, county or any other jurisdictional funding for such requests.

2.2 Traffic data is fed into the Regional Archive Data System (RADS) in order to combine with other existing forms of traffic data from sources such as the Freeway Management System (FMS) data, Phoenix Fire Computer Aided Dispatch, Anonymous Re-Identification (ARID) data, and other, state, city and county government agencies data. The information integrated into RADS is then shared with AZ511, Dynamic Message Signs, In-Vehicle systems and other parties eligible to view the data.

2.3 Travel times are currently provided to travelers along freeways and along some arterial roads through the use of Dynamic Message Signs (DMS) through websites, in-vehicle systems and other applications. The Departments wish to continue providing traveler information to the public on freeways as well as parallel corridors and other major corridors through the state.

2.4 The Departments currently use traffic data to report performance and support freeway and arterial traffic operations including addressing the gaps in existing traffic detection.

2.5 Traffic volumes are also very desirable to the Departments in order to determine and track changes in volume over a period of time. It is valuable for evaluating changes made to the roadway system when before and after volumes can be compared.

3. General Requirements

3.1 Definitions

3.1.1 Department Contract Administrator: ADOT Procurement Office assigned Procurement Officer.

3.1.2 Region: An area specified by an Arizona local jurisdiction that chooses to hire a vendor for their services. This area may include a county, city, or metropolitan area within the State of Arizona.

3.1.3 Typical Trips: Detailed information specifying trips and routes that a large number of drivers tend to take on a daily basis.

3.1.4 Traffic Pattern Data: Utilize data such as average traffic speeds along all US routes, freeway sections, local routes and arterials within the State of Arizona, at various times of the day and days of the week to display the traffic trends and suggest alternate routes or analyze where roadways may need improvements.

3.1.5 Regional Archive Data System (RADS): A database system that provides warehousing, processing and integration of regional ITS Data in the greater Phoenix Area.

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4. Specific Requirements

4.1 Statewide Data

4.1.1 Contractor will provide traffic data and information to the Department and shall cover the entire state including all state routes, U.S. routes, freeway sections, local routes and arterials within the state. The Contractor may provide one or more of the data services below:

A. Historical Traffic: Historical traffic information for the State of Arizona.

B. Traffic Volume Count: Derived traffic volume counts for the State of Arizona including local cities, towns, counties, metropolitan planning organizations, universities and other local jurisdictions.

C. Travel Time: Travel time along all state routes, US routes, freeway sections, local routes and arterials as well as provide travel times to and from locations within the given region. The travel time shall include, at a minimum, segment identifiers, direction, travel time, speed, and data quality indicators. The travel time data shall be updated at a one (1) minute rate as well as provide a secured data connection using XML industry standards.

D. Traffic Analytics: Data analytics for typical trips made statewide along all state routes, US routes, freeway sections, local routes and arterials. This data would be useful if paired with the travel times for the typical trips along all state routes, US routes, freeway sections, local routes and arterials.

E. Predictive Traffic: Predictive traffic data along with the historical data and assurance of the prediction quality throughout the State of Arizona along all state routes, US routes, freeway sections, local routes and arterials. This data will aid in evaluating the need for transportation projects as well as the effects of them.

F. Traffic Patterns: Traffic pattern data throughout the state along all state routes, U.S. routes, freeway sections, local routes and arterials.

G. Performance Measures: Performance measure services for the data provided to the jurisdictions.

H. Mapping Data: High definition map data services to support emerging technologies such as connected and autonomous vehicles.

I. User Interface: User interface for visualization of real-time travel data in the State of Arizona for all state routes, US routes, freeway sections, local routes and arterials that includes mapping services. The web-based interface shall work off of a GIS map system that utilizes modern GIS mapping infrastructure to display travel time, live speed data, as well as highlight severe abnormalities based on historical trend data. Additionally, the

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user interface should include the ability to display travel time trends and statistics. ADOT currently uses TDMS for interfacing with traffic data and already has an interface and web based systems; AZTAMs and APLAN. It is advisable that the new systems work in compliance with the existing software along with Arizona's Linear Referencing System. Dashboard displays of traffic data are also very beneficial and useful in providing easy to understand visuals of transportation data.

J. Archived Data: The jurisdictions should have the ability to archive all real time traffic data for future use by the jurisdictions.

K. Additional Services and Information: Information and costs for any and all other services and information offered within the State of Arizona for all state routes, U.S. routes, freeway sections, local routes and arterials.

4.2 Regional Data

4.2.1 Contractor will provide traffic data and information to the agencies and shall cover the entire state including all state routes, U.S. routes, freeway sections, local routes and arterials within the state. The Contractor may provide one or more of the data services below:

A. Historical Traffic: Historical traffic information for all state routes, U.S. routes, freeway sections, local routes and arterials within a given region within the State of Arizona.

B. Traffic Volume Count: Derived traffic volume counts for regions within the State of Arizona including local cities, towns, counties, metropolitan planning organizations, universities and other local jurisdictions to enhance and expand upon the existing traffic counting activities.

C. Travel Time: Travel time along all state routes, US routes, freeway sections, local routes and arterials as well as provide travel times to and from locations within the given region. The travel time shall include, at a minimum, segment identifiers, direction, travel time, speed, and data quality indicators. The travel time data shall be updated at a one (1) minute rate as well as provide a secured data connection using XML industry standards.

D. Traffic Analytics: Data analytics for typical trips made statewide along all state routes, US routes, freeway sections, local routes and arterials. This data would be useful if paired with the travel times for the typical trips along all state routes, US routes, freeway sections, local routes and arterials within the given region.

E. Predictive Traffic: Predictive traffic data along with the historical data and assurance of the prediction quality throughout the State of Arizona along all state routes, US routes, freeway sections, local routes and arterials. This data will aid in evaluating the need for transportation projects as well as the effects of them.

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F. Traffic Patterns: Traffic pattern data throughout the state along all state routes, U.S. routes, freeway sections, local routes and arterials.

G. Queue Data: Queuing data for all state routes, US routes, freeway sections, local routes and arterials within a given region.

H. Bottleneck Data: Data to identify and rank bottleneck locations within a region along with a visualization of the ranked, bottleneck locations.

I. Performance Measures: Performance measure services for the data provided to the jurisdictions.

J. Mapping Data: High definition map data services to support emerging technologies such as connected and autonomous vehicles.

K. User Interface: User interface for visualization of real-time travel data in the State of Arizona for all state routes, US routes, freeway sections, local routes and arterials that includes mapping services. The web-based interface shall work off of a GIS map system that utilizes modern GIS mapping infrastructure to display travel time, live speed data, as well as highlight severe abnormalities based on historical trend data. Additionally, the user interface should include the ability to display travel time trends and statistics. ADOT currently uses TDMS for interfacing with traffic data and already has an interface and web based systems; AZTAMs and APLAN. It is advisable that the new systems work in compliance with the existing software along with Arizona's Linear Referencing System. Dashboard displays of traffic data are also very beneficial and useful in providing easy to understand visuals of transportation data.

L. Archived Data: The jurisdictions should have the ability to archive all real time traffic data for future use by the jurisdictions.

M. Additional Services and Information: Information and costs for any and all other services and information offered within the State of Arizona for all state routes, U.S. routes, freeway sections, local routes and arterials.

4.3 Corridors

4.3.1 Contractor will provide traffic data and information to the agencies and shall cover the entire state including all state routes, U.S. routes, freeway sections, local routes and arterials within the state. The Contractor may provide one or more of the data services below:

A. Historical Traffic: Historical traffic information for given corridors along all state routes, U.S. routes, freeway sections, local routes and arterials within the State of Arizona.

B. Traffic Volume Count: Derived traffic volume counts for given corridors within the State of Arizona including local cities, towns, counties, metropolitan planning organizations,

universities and other local jurisdictions in order to enhance and expand upon the existing traffic counting activities.

C. Travel Time: Travel time along given corridors for all state routes, U.S. routes, freeway sections, local routes and arterials as well as provide travel times to and from locations. The travel time shall include, at a minimum, segment identifiers, direction, travel time, speed, and data quality indicators. The travel time data shall be updated at a one (1) minute rate as well as provide a secured data connection using XML industry standards.

D. Traffic Analytics: Data analytics for typical trips made along given corridors. This data would be useful if paired with the travel times for the typical trips on corridors along all state routes, U.S. routes, freeway sections, local routes and arterials.

E. Predictive Traffic: Predictive traffic data along with the historical data and assurance of the prediction quality for given corridors along all state routes, US routes, freeway sections, local routes and arterials. This data will aid in evaluating the need for transportation projects as well as the effects of them.

F. Traffic Patterns: Traffic pattern data for give corridors along all state routes, U.S. routes, freeway sections, local routes and arterials.

G. Queue Data: Queuing data for given corridors along all state routes, US routes, freeway sections, local routes and arterials.

H. Bottleneck Data: Data to identify and rank bottleneck locations for given corridors along all state routes, U.S. routes, freeway sections, local routes and arterials as well as provide a visualization of the ranked, bottleneck locations

I. Performance Measures: Performance measure services for the data provided to the jurisdictions for the given corridors along all state routes, US routes, freeway sections, local routes and arterials.

J. Mapping Data: High definition map data services to support emerging technologies such as connected and autonomous vehicles.

K. User Interface: User interface for visualization of real-time travel data for the given corridors all state routes, US routes, freeway sections, local routes and arterials that includes mapping services. The web-based interface should work off of a GIS map system that utilizes modern GIS mapping infrastructure to display travel time, live speed data, as well as highlight severe abnormalities based on historical trend data. Additionally, the user interface should include the ability to display travel time trends and statistics. ADOT currently uses TDMS for interfacing with traffic data and already has an interface and web based systems; AZTAMs and APLAN. It is advisable that the new systems work in compliance with the existing software along with Arizona's Linear Referencing System. Dashboard displays of traffic data are also very beneficial and useful in providing easy to understand visuals of transportation data.

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L. Archived Data: Jurisdictions should have the ability to archive all real time traffic data for future use by the jurisdictions.

M. Additional Services and Information: Information and costs for any and all other services and information offered for corridors along all state routes, U.S. routes, freeway sections, local routes and arterials within the State of Arizona.

4.4 The offered services shall be in a well published data structure. The Contractor(s) shall provide information on data structure (e.g. schema definition) used for sharing the listed services with a jurisdiction along with any form of software provided or needed to access and use the data. For example, if a mapping service is provided as a geospatial file, it should be stated as such in your response.

5. Contractor Responsibilities

5.1 Provide access to the traffic data via a secure method process. The Contractor shall provide data access methodology in proposal for the agency.

5.2 Provide real-time traffic data to the Department in the XML format or other agreed-upon formats, for integration into existing traffic or incident management applications.

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1. **CONTRACT TERM**

The term of any resultant contract shall commence on the effective day of award and shall continue for a period of twelve (12) months thereafter, unless terminated, cancelled or extended as otherwise provided herein.

2. **CONTRACT EXTENSION**

By mutual written contract amendment, any resultant contract may be extended for supplemental periods of up to a maximum of forty-eight (48) months.

3. **ELIGIBLE AGENCIES**

This contract shall be for the use of all State of Arizona departments, agencies and boards. In addition, eligible universities, political subdivisions and nonprofit educational or public health institutions may participate at their discretion. In order to participate in any resultant contract, a university, political subdivision or nonprofit educational or public health institution must have entered into a cooperative agreement with the State Procurement Office as required by A.R.S. §41-2632.

4. **NON-EXCLUSIVE CONTRACT**

This contract shall be for the sole convenience of the Department. The Department reserves the right to obtain like goods or services from another source when necessary. The Off-Contract Purchase Authorization and subsequent procurement shall be consistent with the Arizona Procurement Code.

5. **ORDERING PROCESS**

The Department shall issue a purchase order to the Contractor. Each purchase order must cite the contract number. This purchase order shall be the only document required for the Department to order and the Contractor to deliver the material and/or service.

Any attempts to represent any material and/or service not specifically awarded as being under contract is a breach of the contract and a violation of the Arizona Procurement Code. Any such action is subject to the legal and contractual remedies available to the State inclusive of but not limited to contract cancellation, suspension and/or debarment of the Contractor.

6. **INVOICING REQUIREMENTS**

Separate invoices are required for each delivery of service and shall include at a minimum:

- Department Location's Name and Address
- Vendor Name, Remit to Address and Contact Information
- Contract Number
- Purchase Order Number
- Invoice Number and Date

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- Date the items were shipped to the Department
- Contract Line Item Number
- Line Item Description or Item or Service
- Quantity Purchased
- Line Item Unit of Measure
- Price per Unit and Total per Unit
- Catalog or Other Discount (if applicable)
- Net Unit Price and Total per Unit (if applicable)
- Applicable taxes
- Applicable Shipping/Freight Charges
- Total Invoice Amount Due

Invoices not sent to the proper address, or not containing the necessary and required information may delay payment. A Contractor whose payments are delayed due to improper invoicing shall make no claim against the Department or the State for late or finance charges.

The Department will make every effort to process payment within thirty (30) calendar days after acceptance of services. Delivery of the service to the Department does not constitute acceptance.

The date the Department accepts delivery of services shall be the valid date for starting the thirty (30) calendar day payment period.

Payment due dates, including discount periods, will be computed from the date of acceptance or date of correct invoice (whichever is later) to the date the Department's warrant is mailed.

7. ESTIMATED USAGE

The Department anticipates considerable usage under this contract. The Department reserves the right to increase or decrease actual quantities ordered as circumstances may require. No guarantees are made concerning actual purchases under this contract.

8. PRICE REDUCTION

A price reduction adjustment may be offered at any time during the term of the contract and shall become effective upon notice through a written contract amendment.

9. PRICE ADJUSTMENT

The Department will review **fully documented** requests for price increases for any contract which will or has been in effect for twelve (12) months. The request shall be submitted no less than 60 days prior to the contract renewal date. The Contractor shall provide fully documented information which supports the price increase request. Fully documented means that the request shall present detailed information and calculations that make it clear how the claimed increase has an impact on the contract unit prices. All assumptions regarding cost factors that have an impact on the requested increase shall also be clearly identified and justified. The requested price increase must be based upon a cost increase that was clearly unpredictable at the time of the offer and can be shown to directly affect the price of the

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item concerned. Any price increase adjustment request prior to the time of contract extension will be a factor in the extension review process. The Department will determine whether the requested price increase or an alternate option, is in the best interest of the State.

10. CONTRACT ADMINISTRATION

The contractor shall contact the Procurement Officer for guidance or direction in matters of contract interpretation or questions regarding the terms, conditions or scope of the contract.

11. NOTICES

All notices, requests demands, consents, approvals, and other communications which may or are required to be served or given hereunder (for the purpose of these provisions collectively called "Notices"), shall be in writing and shall be sent by registered or certified United States mail, return receipt requested, postage prepaid, addressed to the party or parties to receive such notice as follows:

a. If intended to the State, to:

Arizona Department of Transportation, Procurement Group
1739 West Jackson Street, Ste. A, MD 100P
Phoenix, Arizona 85007-3276
Attention: Amir Sakhi – Procurement Officer

b. If intended for the Contractor, to the address as identified in the Contractor's electronic vendor profile.

Or to such other address as either party may from time to time furnish in writing to the other by notice hereunder. Any notice so mailed shall be deemed to have been given as of the date such notice is received as shown on the return receipt. Furthermore, such notice may be given by delivering personally such notice, if intended for the State, to the Arizona Department of Transportation, Chief Procurement Officer and if intended for the Contractor, to the person named on the Offer and Contract award Form of this Contract, or to such other person as either party may from time to time furnish in writing to the other by notice hereunder. Any notice so delivered shall be deemed to have been given as of the date such notice is personally delivered to the other party.

12. CANCELLATION FOR POSSESSION OF WEAPONS ON THE DEPARTMENT PROPERTY

This Contract may be cancelled if the Contractor or any subcontractors or others in the employ or under the supervision of the Contractor or subcontractors is found to be in possession of weapons.

Possession of weapons (firearms, explosive devices, knives or blades of more than three (3) inches, or any other instrument designed for lethal or disabling use) is prohibited on ADOT property.

Further, if the Contractor or any subcontractors or others in the employ of under the supervision of the Contractors or subcontractors, are asked by an ADOT official to leave the ADOT property, they are advised that failure to comply with such a request shall result in cancellation of the Contract and anyone

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who refuses, whether armed or not, is subject to prosecution under A.R.S. §13-1502, "Criminal trespass in the third degree: classification".

13. REVIEW OF CONTRACTOR'S WORK

Work performed by the Contractor shall be subject to periodic reviews and partial acceptance at various stages. The Department reserves the right to make such reviews and pass upon the acceptability of the Contractor's work. Partial acceptance shall not relieve the Contractor's obligation to correct, without charge, any errors in the work performed under this contract.

14. ACCURACY OF WORK

The Contractor shall be responsible for the accuracy of the work and shall promptly make all the necessary revisions or corrections resulting from errors and omissions on the part of the Contractor without additional compensation. Acceptance of the work by the Department will not relieve the Contractor of the responsibility for subsequent correction of any such errors and clarification of ambiguities.

15. INDEMNIFICATION

To the fullest extent permitted by law, Contractor shall defend, indemnify, and hold harmless the State of Arizona, and its departments, agencies, boards, commissions, universities, officers, officials, agents, and employees (hereinafter referred to as "Indemnitee") from and against any and all claims, actions, liabilities, damages, losses, or expenses (including court costs, attorneys' fees, and costs of claim processing, investigation and litigation) (hereinafter referred to as "Claims") for bodily injury or personal injury (including death), or loss or damage to tangible or intangible property caused, or alleged to be caused, in whole or in part, by the negligent or willful acts or omissions of Contractor or any of its owners, officers, directors, agents, employees or subcontractors. This indemnity includes any claim or amount arising out of, or recovered under, the Workers' Compensation Law or arising out of the failure of such Contractor to conform to any federal, state, or local law, statute, ordinance, rule, regulation, or court decree. It is the specific intention of the parties that the Indemnitee shall, in all instances, except for Claims arising solely from the negligent or willful acts or omissions of the Indemnitee, be indemnified by Contractor from and against any and all claims. It is agreed that Contractor will be responsible for primary loss investigation, defense, and judgment costs where this indemnification is applicable. In consideration of the award of this contract, the Contractor agrees to waive all rights of subrogation against the State of Arizona, its officers, officials, agents, and employees for losses arising from the work performed by the Contractor for the State of Arizona.

This indemnity shall not apply if the contractor or sub-contractor(s) is/are an agency, board, commission or university of the State of Arizona.

16. INSURANCE

The Contractor shall furnish certificate(s) of insurance inclusive of the following requirements as stated within to the Department. Certificate(s) shall be received **within five (5) calendar days** of notification of contract award by the Procurement Officer and prior to contract execution.

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16.1 **Insurance Requirements**

Contractor and subcontractors shall procure and maintain, until all of their obligations have been discharged, including any warranty periods under this Contract, insurance against claims for injury to persons or damage to property arising from, or in connection with, the performance of the work hereunder by the Contractor, its agents, representatives, employees or subcontractors.

The Insurance Requirements herein are minimum requirements for this Contract and in no way limit the indemnity covenants contained in this Contract. The State of Arizona in no way warrants that the minimum limits contained herein are sufficient to protect the Contractor from liabilities that arise out of the performance of the work under this Contract by the Contractor, its agents, representatives, employees or subcontractors, and the Contractor is free to purchase additional insurance.

Minimum Scope and Limits of Insurance

Contractor shall provide coverage with limits of liability not less than those stated below.

Commercial General Liability (CGL) – Occurrence Form

Policy shall include bodily injury, property damage, and broad form contractual liability coverage.

- General Aggregate $2,000,000
- Products – Completed Operations Aggregate $1,000,000
- Personal and Advertising Injury $1,000,000
- Damage to Rented Premises $50,000
- Each Occurrence $1,000,000

a. The policy shall be endorsed, as required by this written agreement, to include the State of Arizona, and its departments, agencies, boards, commissions, universities, officers, officials, agents, and employees as additional insureds with respect to liability arising out of the activities performed by or on behalf of the Contractor.

b. Policy shall contain a waiver of subrogation endorsement, as required by this written agreement, in favor of the State of Arizona, and its departments, agencies, boards, commissions, universities, officers, officials, agents, and employees for losses arising from work performed by or on behalf of the Contractor.

Business Automobile Liability

Bodily Injury and Property Damage for any owned, hired, and/or non-owned automobiles used in the performance of this Contract.

- Combined Single Limit (CSL) $1,000,000

a. Policy shall be endorsed, as required by this written agreement, to include the State of Arizona, and its departments, agencies, boards, commissions, universities, officers, officials, agents, and

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employees as additional insureds with respect to liability arising out of the activities performed by, or on behalf of, the Contractor involving automobiles owned, hired and/or non-owned by the Contractor.

b. Policy shall contain a waiver of subrogation endorsement as required by this written agreement in favor of the State of Arizona, and its departments, agencies, boards, commissions, universities, officers, officials, agents, and employees for losses arising from work performed by or on behalf of the Contractor.

Workers' Compensation and Employers' Liability

• Workers' Compensation	Statutory
• Employers' Liability	
• Each Accident	$1,000,000
• Disease – Each Employee	$1,000,000
• Disease – Policy Limit	$1,000,000

a. Policy shall contain a waiver of subrogation endorsement, as required by this written agreement, in favor of the State of Arizona, and its departments, agencies, boards, commissions, universities, officers, officials, agents, and employees for losses arising from work performed by or on behalf of the Contractor.

b. This requirement shall not apply to each Contractor or subcontractor that is exempt under A.R.S. § 23-901, and when such Contractor or subcontractor executes the appropriate waiver form (Sole Proprietor or Independent Contractor).

Professional Liability (Errors and Omissions Liability)

• Each Claim	$2,000,000
• Annual Aggregate	$2,000,000

a. In the event that the Professional Liability insurance required by this Contract is written on a claims-made basis, Contractor warrants that any retroactive date under the policy shall precede the effective date of this Contract and, either continuous coverage will be maintained, or an extended discovery period will be exercised, for a period of two (2) years beginning at the time work under this Contract is completed.

b. The policy shall cover professional misconduct or negligent acts for those positions defined in the Scope of Work of this contract.

Additional Insurance Requirements

The policies shall include, or be endorsed to include, as required by this written agreement, the following provisions:

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The Contractor's policies, as applicable, shall stipulate that the insurance afforded the Contractor shall be primary and that any insurance carried by the Department, its agents, officials, employees or the State of Arizona shall be excess and not contributory insurance, as provided by A.R.S. §41-621 (E). Insurance provided by the Contractor shall not limit the Contractor's liability assumed under the indemnification provisions of this Contract.

Notice of Cancellation

Applicable to all insurance policies required within the Insurance Requirements of this Contract, Contractor's insurance shall not be permitted to expire, be suspended, be canceled, or be materially changed for any reason without thirty (30) days prior written notice to the State of Arizona. Within two (2) business days of receipt, Contractor must provide notice to the State of Arizona if they receive notice of a policy that has been or will be suspended, canceled, materially changed for any reason, has expired, or will be expiring. Such notice shall be sent directly to the Department and shall be mailed, emailed, hand delivered or sent by facsimile transmission to (State Representative's Name, Address & Fax Number).

Acceptability of Insurers

Contractor's insurance shall be placed with companies licensed in the State of Arizona or hold approved non-admitted status on the Arizona Department of Insurance List of Qualified Unauthorized Insurers. Insurers shall have an "A.M.Best" rating of not less than A- VII. The State of Arizona in no way warrants that the above-required minimum insurer rating is sufficient to protect the Contractor from potential insurer insolvency.

Verification of Coverage

Contractor shall furnish the State of Arizona with certificates of insurance (valid ACORD form or equivalent approved by the State of Arizona) evidencing that Contractor has the insurance as required by this Contract. An authorized representative of the insurer shall sign the certificates.

All such certificates of insurance and policy endorsements must be received by the State before work commences. The State's receipt of any certificates of insurance or policy endorsements that do not comply with this written agreement shall not waive or otherwise affect the requirements of this agreement.

Each insurance policy required by this Contract must be in effect at, or prior to, commencement of work under this Contract. Failure to maintain the insurance policies as required by this Contract, or to provide evidence of renewal, is a material breach of contract.

All certificates required by this Contract shall be sent directly to the Department. The State of Arizona project/contract number and project description shall be noted on the certificate of insurance. The State of Arizona reserves the right to require complete copies of all insurance policies required by this Contract at any time.

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Subcontractors

Contractor's certificate(s) shall include all subcontractors as insureds under its policies or Contractor shall be responsible for ensuring and/or verifying that all subcontractors have valid and collectable insurance as evidenced by the certificates of insurance and endorsements for each subcontractor. All coverages for subcontractors shall be subject to the minimum Insurance Requirements identified above. The Department reserves the right to require, at any time throughout the life of the Contract, proof from the Contractor that its subcontractors have the required coverage.

Approval and Modifications

The Contracting Agency, in consultation with State Risk, reserves the right to review or make modifications to the insurance limits, required coverages, or endorsements throughout the life of this contract, as deemed necessary. Such action will not require a formal Contract amendment but may be made by administrative action.

Exceptions

In the event the Contractor or subcontractor(s) is/are a public entity, then the Insurance Requirements shall not apply. Such public entity shall provide a certificate of self-insurance. If the Contractor or subcontractor(s) is/are a State of Arizona agency, board, commission, or university, none of the above shall apply.

17. NON-DISCLOSURE

The Contractor shall meet the requirements of all applicable State of Arizona and Department policies, standards and procedures for securing, managing and handling information. As such, the Contractor shall:

A. Only access information and files for which it has been given specific authority.
B. Not discuss, divulge, copy, release, sell or loan any Departmental information unless authorized by the Department.
C. Not misuse or carelessly handle Departmental information.
D. Not release or disclose Departmental information to unauthorized personnel.
E. Store, send, and dispose of system and written information in a secure manner with proper regard for privacy and confidentiality and in accordance with applicable policies, standards and procedures.
F. Not disclose any personal information contained in any system of record except as authorized.
G. Safeguard all user password(s) and any other security mechanism(s) granted by the Department and used to access Departmental information.
H. Protect all Departmental information in accordance with applicable state and federal laws.
I. Report any security system breach, computer infection or theft of information immediately to the Department.

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The Contractor shall secure paper-based, program data by locking it in secure containers and applying user-privilege restriction mechanisms. The Contractor shall be responsible and accountable for all actions undertaken on a Department information technology resource (e.g., computer system, or application system, etc.). The Contractor shall not utilize its network connections with the Department for any purpose other than the purpose specified herein.

18. IT 508 COMPLIANCE

Unless specifically authorized in the Contract, any electronic or information technology offered to the State of Arizona under this solicitation shall comply with A.R.S. 41-2531 and 2532 and Section 508 of the Rehabilitation Act of 1973, which requires that employees and members of the public shall have access to and use of information technology that is comparable to the access and use by employees and members of the public who are not individuals with disabilities.

19. INFORMATION AND EQUIPMENT USE

Prohibited uses and activities by the Contractor include:

A. Connecting non-Department or personal electronic equipment to Department networks or technology resources except for approved remote access.

B. Using the Department's electronic equipment as a platform to gain unauthorized access to other systems or equipment.

C. The unauthorized acquisition, use, reproduction, transmission, or distribution of any controlled information including computer software and data, including personally identifying or privacy information, copyrighted, trademarked or material with other intellectual property rights (beyond fair use), proprietary data, or export controlled software or data.

D. Storing, sending or transmitting any personal identifying information (PII) in an unencrypted form.

E. Engaging in any conduct that would constitute a criminal offense, give rise to civil liability, or otherwise violate any local, state, federal law, order or regulation.

F. Using or distributing tools designed for compromising security, such as password guessing programs, decoders, password gatherers, unauthorized keystroke loggers, analyzers, cracking tools, packet sniffers, encryption circumvention devices, or Trojan Horse programs. Unauthorized port scanning, for any reason, is strictly prohibited.

G. Accessing any other person's computer or computer system, software, or data; or attempt to circumvent the user authentication or security of any host, network, or account. This includes, but is not limited to, accessing data not intended for the contractor, logging into or making use of a server or account that is not expressly authorized to access, or probing the security of other hosts, networks, or accounts.

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SPECIAL TERMS AND CONDITIONS

20. OWNERSHIP

All deliverables and/or other products of the contract (including but not limited to all software documentation, reports, records, summaries and other matter and materials prepared or developed by the Contractor in performance of the contract) shall be the sole, absolute and exclusive property of the State of Arizona, free from any claim or retention of right on the part of the Contractor, its agents, subcontractors, officers or employees.

21. INTELLECTUAL PROPERTY INDEMNIFICATION

With respect solely to Materials provided or proposed by Contractor or Contractor's agents, employees, or subcontractors (each a "Contractor Party") for performance of this Contract, Contractor shall indemnify, defend and hold harmless the State, its departments, agencies, boards, commissions, universities, officers, agents and employees (collectively, the "Indemnitee"), against any third party claims for liability, including, but not limited to, reasonable costs and expenses, including attorneys' fees, for infringement or violation of any patent, trademark, copyright or trade secret, by such Materials or the State's use thereof.

In addition, with respect to claims arising from computer hardware or software manufactured or developed solely by a third party, Contractor shall pass through to the State such indemnity rights as it received from such third party (the "Third Party Obligation") and will cooperate in enforcing them, provided, however, that (i) if the third party manufacturer fails to honor the Third Party Obligation, or (ii) the Third Party Obligation is insufficient to fully indemnify the State, Contractor shall indemnify, defend and hold harmless the State against such claims in their entirety or for the balance of any liability not fully covered by the Third Party Obligation.

The State shall reasonably notify the Contractor of any claim for which Contractor may be liable under this section. If the Contractor is insured pursuant to A.R.S. § 41-621 and § 35-154, this section shall not apply. Contractor shall have control, subject to the reasonable approval of the State, of the defense of any action on such claim and all negotiations for its settlement or compromise, provided, however, that when substantial principles of government or public law are involved or when involvement of the State is otherwise mandated by law, the State may elect, in its sole and absolute discretion, to participate in such action at its own expense with respect to attorneys' fees and costs, but no liability, and the State shall have the right to approve or disapprove any settlement, which approval shall not be unreasonably withheld or delayed. The State shall reasonably cooperate in the defense and any related settlement negotiations.

If Contractor believes at any time that any Materials provided or in use pursuant to this Contract infringe a third party's intellectual property rights, Contractor shall, at Contractor's sole cost and expense, and upon receipt of the State's prior written consent, which shall not be unreasonably withheld, (i) replace an infringing Material with a non-infringing Material; (ii) modify the infringing Material to be non-infringing, provided that following any replacement or modification made pursuant to the foregoing, the Material continues to function in accordance with the Contract. Contractor's failure or inability to accomplish any of the foregoing shall be deemed a material breach of this Contract.

ADOT Procurement

SPECIAL TERMS AND CONDITIONS

Notwithstanding the foregoing, Contractor shall not be liable for any claim for infringement based solely on any Indemnitee's:

i. Modification of Materials provided by Contractor other than as contemplated by the Contract or the specifications of such Materials or as otherwise authorized or proposed in any way by Contractor or a Contractor Party;

ii. Use of the Materials in a manner other than as contemplated by the Contract or the specifications of such Materials, or as otherwise authorized or proposed in any way by Contractor or a Contractor Party; or

iii. Use of the Materials in combination, operation, or use with other products in a manner not contemplated by the Contractor, or, the specifications of such Materials, or as otherwise authorized or proposed in any way by Contractor or a Contractor Party.

Contractor certifies, represents and warrants to the State that it has appropriate systems and controls in place to ensure that State funds will not be used in the performance of the Contract for the acquisition, operation or maintenance of Materials in violation of intellectual property laws.

22. SOFTWARE UPDATES

The Contractor shall provide, at no additional charge, all new releases and updates of the software while under a maintenance agreement. Release shall be defined as any collection of enhancements or updates which the contractor generally makes available to its installed base of customers of such programs.

23. SOFTWARE ERRORS

A software error is defined as any failure of the Contractor's software to perform according to prescribed business requirements and/or design specifications. Following the Department's written acceptance of the Contractor's solution or subsequent enhancements, the contractor shall correct any software error at no charge to the Department.

24. ACCEPTABLE USE

The Contractor understands that end user identification and password combinations are the means of access to Department electronic information systems and that contracted individuals are accountable for actions undertaken with assigned User IDs. Contracted individuals will agree to abide by all applicable federal laws, state laws, statewide and Department policies; and will not:

A. Reveal Department password(s) to anyone;

B. Use another person's Department password(s);

C. Ask another person to reveal their Department password(s);

D. Reveal Department data to any person or entity unless in conjunction with state business;

E. Attempt to or access Department data not related to prescribed job duties.

ADOT Procurement

SPECIAL TERMS AND CONDITIONS

The Contractor agrees there shall be no unauthorized duplication or distribution of software on Department electronic computer equipment. This includes the duplication or distribution of software licensed to the Department for private use or for sale to third parties. The Contractor agrees the performance of such unauthorized duplication or distribution shall be subject to civil and criminal penalties under both state and federal statutes.

25. CONTRACTOR'S OBLIGATION REGARDING CONFIDENTIALITY

Due to the sensitive nature of the information maintained by the Department, the Contractor acknowledges that all information disclosed to it concerning the Department's operations during performance of the contract and after the full term of the contract shall not be disclosed without the Department's prior written consent.

All proprietary information and all copies thereof shall be returned to the Department upon completion of the work for which they were obtained or developed.

26. CONFIDENTIALITY OF RECORDS

The Contractor shall establish and maintain procedures and controls acceptable to the Department for the purpose of assuring that information or data in its possession is not mishandled, misused, released, disclosed, or used in an inappropriate manner by it, its agents, officers, or employees. This includes information contained in its records obtained from the Department or others, necessary for contract performance. The Contractor shall take all reasonable steps and precautions to safeguard this information and data and shall not divulge the information or data to parties other than those needed for the performance of duties under the contract.

27. CONFIDENTIALITY (END USERS)

Notwithstanding aggregate usage statistics used for reporting purposes, Contractor shall keep confidential all information concerning individual end-users. Contractor shall not, under any conditions, resell, transfer or convey information about end-users to any third party. Contractor shall not retain or reuse information about the end-users in their own operations.

28. DATA DESTRUCTION

Upon termination, cancellation, expiration or other conclusion of the Contract, the Contractor shall return the data to the Department unless the Department requests that such data be destroyed. This provision shall also apply to data that is in the possession of subcontractors or agents of Contractor. The Contractor shall complete such return or destruction not less than thirty (30) days after the conclusion of this Contract. Within such thirty (30) day period, the Contractor shall certify in writing to the Department that such return or destruction has been completed.

All subcontractors utilized to perform the activities authorized by this Contract must abide by the same security and access requirements as the Contractor. The Contractor must disclose and obtain Department approval of any existing and/or contemplated strategic alliances, partnerships,

ADOT Procurement

SPECIAL TERMS AND CONDITIONS

Intergovernmental Agreements or subcontracting agreements the Contractor has or will enter into which involve the processing and/or use of Department data acquired pursuant to this Contract.

29. INCIDENT NOTIFICATION

The Contractor agrees to notify the Department immediately when the Contractor system that may access, process, or store Department data is subject to unintended access. Unintended access includes compromise (e.g., computer malware, search engine web crawler, password compromise) or access by an individual or automated program due to a failure to secure a system or adhere to established security procedures.

The Contractor agrees to notify the Department immediately if there is a threat to the Contractor's program or product as it pertains to the use, disclosure, and security of Department data. If an unauthorized use or disclosure of any personal information occurs, the Contractor shall provide written notice immediately after Contractor's discovery of such use or disclosure and all information ADOT requests concerning such unauthorized use or disclosure.

30. ENCRYPTION

The Contractor shall implement encryption technologies to protect Department data. Data encrypted at rest shall use, at a minimum, Advanced Encryption Standard, 256-bit key encryption. Data transmissions shall use Secure Sockets Layer (SSL) or Transport Layer Security (TLS) and/or IP Security (IPsec) encryption. Backups to tape or other media for storage on-site and/or off-site shall be encrypted to protect against accidental or intentional disclosure. Encryption keys shall be kept separate from backups they encrypt. The Contractor shall apply full disk encryption to devices that store Department information.

31. ACCESS CONSTRAINTS AND AUTHORIZATION REQUIREMENTS

Contractor access to the Department's information technology environment and resources shall be properly authorized, based on business need and will be restricted to least possible privilege. Upon approval of access privileges, the Contractor shall maintain strict adherence to all prescribed security policies, standards and procedures.

Failure of the Contractor, its agents or subcontractors to comply with prescribed security policies, standards and procedures including any person who commits an unlawful breach of computer security or harmful access will be subject to prosecution under appropriate state and/or federal law.

Any and all recovery or reconstruction costs or other liabilities associated with an unlawful breach of computer security or harmful access shall be paid by the Contractor.

32. NON-ADOT INFRASTRUCTURE

ADOT prohibits the installation and use of personally-owned or contractor/subcontractor-owned equipment or software on the Department's network. If non-ADOT owned equipment must be used to fulfill the requirements of this contract, it must be stated in contract. All of the security controls

required for ADOT equipment must be utilized in approved Contractor equipment and must be funded and maintained by the owner. Software must be kept current, including all critical updates and patches.

33. REMOVAL OF CONTRACTOR'S EMPLOYEES

The Contractor agrees to utilize only experienced, responsible and capable personnel in the performance of the work. The Department may require that the Contractor remove from the job covered by this contract, employees who endanger persons or property or whose continued employment under the contract is inconsistent with the interest of the Department.

34. TRIBAL CONSULTATION

In the event that this project is located within tribal land or includes tribal involvement as a stakeholder, ADOT-MPD and the consultant must exercise tribal consultation and coordination protocol when providing related services to the Indian/Native American Tribe/Nation/Community. The ADOT PM will provide the ADOT Tribal Transportation Consultation Process Reference Manual to the consultant upon selection. The purpose for this provision is to ensure compliance with "ADOT's Tribal Consultation Policy" and Executive order No. 2006-14: consultation and cooperation with Arizona tribes located at: (http://azmemory.azlibrary.gov/cdm/singleitem/collection/execorders/id/508/rec/1). For a general idea of what that protocol entails, a related national publication source is available at: http://onlinepubs.trb.org/onlinepubs/nchrp/nchrp_rpt_690.pdf.

35. DELIVERABLES DISCLAIMER

The Contractor and its sub-contractors shall include the following disclaimer in each deliverable.

This report was funded in part through grants from the Federal Highway Administration, U.S. Department of Transportation. The contents of this report reflect the views of the authors, who are responsible for the facts and the accuracy of the data, and for the use or adaptation of previously published material, presented herein. The contents do not necessarily reflect the official views or policies of the Arizona Department of Transportation or the Federal Highway Administration, U.S. Department of Transportation. This report does not constitute a standard, specification, or regulation. Trade or manufacturers' names that may appear herein are cited only because they are considered essential to the objectives of the report. The U.S. government and the State of Arizona do not endorse products or manufacturers.

36. POST AWARD MEETING

At the discretion of the Department, the Contractor, at their expense, shall attend and participate in post award meetings as scheduled by the Procurement Officer.

37. USAGE REPORT

The Contractor shall furnish the Department a quarterly report showing purchasing activity under this contract. This usage report shall be provided in a form substantially equivalent to Exhibit 3. Usage

ADOT Procurement

SPECIAL TERMS AND CONDITIONS

reports shall be submitted to the Procurement Officer no later than 30 days after the end of each quarter.

Usage report quarters shall be defined as follows:

- January through March – Report due April 30
- April through June – Report due July 30
- July through September – Report due October 30
- October through December – Report due January 30

38. CONTRACT ORDER OF PRECEDENCE

In the event of a conflict in the provisions of the Contract, as accepted by the Department and as they may be amended, the following shall prevail in the order set forth below:

Federally Funded Contract:

- Federal Terms and Conditions;
- Special Terms and Conditions;
- Uniform Terms and Conditions;
- Statement or Scope of Work;
- Specifications;
- Attachments;
- Exhibits

State Funded Contract:

- Special Terms and Conditions;
- Uniform Terms and Conditions;
- Statement or Scope of Work;
- Specifications;
- Attachments;
- Exhibits

ADOT Procurement

EXHIBIT 1
Title VI/Non-Discrimination Assurances
Appendix A

During the performance of this contract, the contractor, for itself, its assignees, and successors in interest (hereinafter referred to as the "contractor") agrees as follows:

1. **Compliance with Regulations:** The contractor (hereinafter includes consultants) will comply with the Acts and the Regulations relative to Non-discrimination in Federally-assisted programs of the U.S. Department of Transportation, the *Federal Highway Administration,* as they may be amended from time to time, which are herein incorporated by reference and made a part of this contract.

2. **Non-discrimination:** The contractor, with regard to the work performance by it during the contract, will not discriminate on the grounds of race, color, or national origin in the selection and retention of subcontractors, including procurements of materials and leases of equipment. The contractor will not participate directly or indirectly in the discrimination prohibited by the Acts and the Regulations, including employment practices when the contract covers any activity, project, or program set forth in Appendix B of 49 CFR Part 21.

3. **Solicitations for Subcontracts, Including Procurements of Materials and Equipment:** In all solicitations, either by competitive bidding, or negotiation made by the contractor for work to be performed under a subcontract, including procurements of materials, or leases of equipment, each potential subcontractor or supplier will be notified by the contractor of the contractor's obligations under this contract and the Acts and Regulations relative to Non-discrimination on the grounds of race, color, or national origin.

4. **Information and Reports:** The contractor will provide all information and reports required by the Acts, the Regulations, and directives issued pursuant thereto and will permit access to its books, records, accounts, other sources of information, and its facilities as may be determined by the Recipient or the *Federal Highway Administration* to be pertinent to ascertain compliance with such Acts, Regulations, and instructions. Where any information required of a contractor is in the exclusive possession of another who fails or refuses to furnish the information, the contractor will so certify to the Recipient or the *Federal Highway Administration,* as appropriate, and will set forth what efforts it has made to obtain the information.

5. **Sanctions for Noncompliance:** In the event of a contractor's noncompliance with the Non-discrimination provisions of this contract, the Recipient will impose such contract sanctions as it or the *Federal Highway Administration* ,may determine to be appropriate, including, but not limited to:

    a. withholding payments to the contractor under the contract until the contractor complies; and/or
    b. cancelling, terminating, or suspending a contract, in whole or in part.

6. **Incorporation of Provisions:** The contractor will include the provisions of paragraphs one through six in every subcontract, including procurements of materials and leases of equipment, unless exempt by the Acts, the Regulations and directives issued pursuant thereto. The contractor will take action with request to any subcontract or procurement as the Recipient or the *Federal Highway Administration* may direct as a means of enforcing such provisions including sanctions for noncompliance. Provided, that **if** the contractor becomes involved in, or is threatened with litigation by a subcontractor or supplier because of such direction, the contractor may request the Recipient to enter into any litigation to protect the interests of the Recipient. In addition, the contractor may request the United States to enter into the litigation to protect the interests of the United States.

ADOT Procurement

EXHIBIT 3
Usage Report

During the performance of this contract, the contractor, for itself, its assignees, and successors in interest (hereinafter referred to as the "contractor") agrees to comply with the following non-discrimination statutes and authorities; including but not limited to:

Pertinent Non-Discrimination Authorities:

- Title VI of the Civil Rights Act of 1964 (42 U.S.C. § 2000d *et seq.*, 78 stat. 252), (prohibits discrimination on the basis of race, color, national origin): and 49 CFR Part 21.
- The Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, (42 U.S.C. § 4601), (prohibits unfair treatment of persons displaced or whose property has been acquired because of Federal or Federal-aid programs and projects);
- Federal-Aid Highway Act of 1973, (23 U.S.C. § 324 *etseq.),* (prohibits discrimination on the basis of sex);
- Section 504 of the Rehabilitation Act of 1973, (29 U.S.C. § 794 *et seq.),* as amended, (prohibits discrimination on the basis of disability); and 49 CFR Part 27;
- The Age Discrimination Act of 1975, as amended, (42 U.S.C. § 6101 *et seq.),* (prohibits discrimination on the basis of age);
- Airport and Airway Improvement Act of 1982, (49 USC § 471, Section 47123), as amended, (prohibits discrimination based on race, creed, color, national origin, or sex);
- The Civil Rights Restoration Act of 1987, (PL 100-209), (Broadened the scope, coverage and applicability of Title VI of the Civil Rights Act of 1964, The Age Discrimination Act of 1975 and Section 504 of the Rehabilitation Act of 1973, by expanding the definition of the terms "programs or activities" to include all of the programs or activities of the Federal-aid recipients, sub-recipients and contractors, whether such programs or activities are Federally funded or not);
- Titles II and III of the Americans with Disabilities Act, which prohibit discrimination on the basis of disability in the operation of public entities, public and private transportation systems, places of public accommodation, and certain testing entities (42 U.S.C. §§ 12131-12189) as implemented by Department of Transportation regulations at 49 C.F.R. parts 37 and 38;
- The Federal Aviation Administration's Non-discrimination statute (49 U.S.C. § 47123) (prohibits discrimination on the basis of race, color, national origin, and sex);
- Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, which ensures discrimination against minority populations by discouraging programs, policies, and activities with disproportionately high and adverse human health or environmental effects on minority and low-income populations;
- Executive Order 13166, Improving Access to Services for Persons with Limited English Proficiency, and resulting agency guidance, national origin discrimination includes discrimination because of limited English proficiency (LEP). To ensure compliance with Title VI, you must take reasonable steps to ensure that LEP persons have meaningful access to your programs (70 Fed. Reg. at 74087 to 74100);
- Title IX of the Education Amendments of 1972, as amended, which prohibits you from discriminating because of sex in education programs or activities (20 U.S.C. 1687 et. seq).

ADOT Procurement

EXHIBIT 3
Usage Report

Report Date:	Contact's Name:
Contractor's Name:	Contact's Phone Number:
Contract Number:	Contract Description:

QUANTITY	ITEM DISCRIPTION	JANUARY THROUGH MARCH USAGE AMOUNT	APRIL THROUGH JUNE USAGE AMOUNT	JULY THROUGH SEPTEMBER USAGE AMOUNT	OCTOBER THROUGH DECEMBER USAGE AMOUNT	YEAR TO DATE USAGE AMOUNT
		$	$	$	$	$

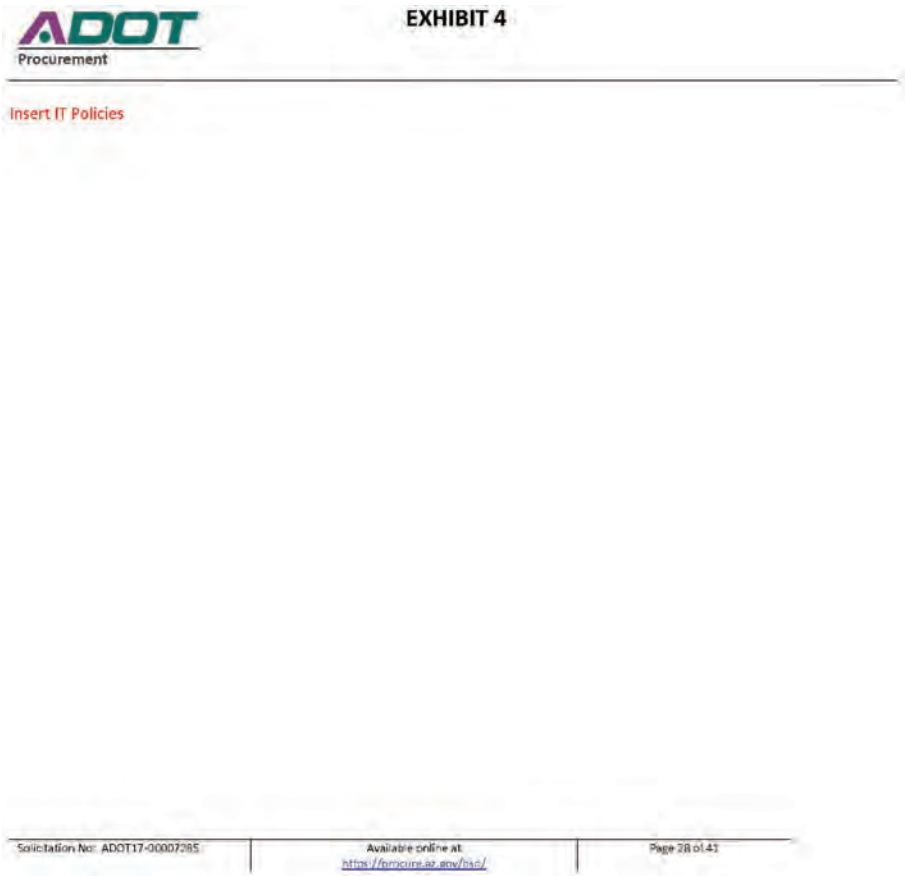
Sample Format

Instruction: In accordance with the contract award date this usage report should define the following quarters:

- January through March – Report due April 30
- April through June – Report due July 30
- July through September – Report due October 30
- October through December – Report due January 30

Quarterly Reports shall be submitted to the following Contract Administrator:

Procurement Officer Name
Title
Email address
1739 W. Jackson Street, MD 100P
Phoenix, Arizona 85007



ADOT

ARIZONA DEPARTMENT OF TRANSPORTATION
POLICIES AND PROCEDURES

ITM-4.01 INTERNET

Effective: October 1, 2014
Supersedes: ITM-4.01 (2/7/2012)
Responsible Office: Information Technology Group (602) 712-7300

Review: October 1, 2016
Transmittal: 2014 - October
Page 1 of 4

1.01 PURPOSE

To establish an Internet use policy.

1.02 SCOPE

This policy applies to all users (i.e., employees and contractors) that access the Department's information and technology resources.

1.03 AUTHORITY

Arizona Revised Statutes (A.R.S.) § 38-448 - State employees; access to Internet pornography prohibited; cause for dismissal; definitions

A.R.S. § 41-773 - Causes for dismissal or discipline

Statewide Policy P501 – Internet Use

1.04 DEFINITIONS

Refer to the Information and Technology Management (ITM) Glossary of Terms on the ITG Website for definitions and abbreviations.

1.05 POLICY

Access and use of the Internet imposes responsibilities and obligations on Department employees and contractors (hereinafter referred to as "users"). Internet use must be ethical, in accordance with the ADOT Code of Conduct, reflect honesty and demonstrate respect for intellectual property, ownership of information and system security mechanisms.

1.06 PROHIBITED USES AND ACTIVITIES

Prohibited uses and activities include, but are not limited to, using the Internet or Department equipment:

A. To violate any rules, regulations, or policies applicable to any network, server, computer database, or Web site that you access.

B. For Malicious Intent

1. Accessing any other person's computer or computer system, software, or data; or attempting to circumvent the user authentication or security of any host, network, or account. This includes, but is not limited to, accessing data not intended for you, logging into or making use of a server or account you are not expressly authorized to access, or probing the security of other hosts, networks, or accounts.

2. Using or distributing tools designed for compromising security, such as password guessing programs, decoders, password gatherers, unauthorized keystroke loggers, analyzers, cracking tools, packet sniffers, encryption circumvention devices, or Trojan Horse programs. Unauthorized port scanning, for any reason, is prohibited.

3. Restricting, inhibiting, or otherwise interfering with the ability of any other person, to use or enjoy the Internet, including, posting or transmitting information or software containing a worm, virus, or other harmful feature, or generating levels of traffic sufficient to impede others' ability to send or retrieve information; or otherwise disrupting or causing a performance degradation to the Internet or any host, server, backbone network, node or service, including, denial of service attacks, flooding of a network, overloading a service, improper seizing and abuse of operator privileges and attempts to "crash" a host.

4. Bypassing locks or time-outs built into software.

5. Servicing, altering, modifying, or tampering with Department equipment or Internet service or permitting any other person to do the same who is not authorized by the Department.

6. Engaging in Internet access that circumvents the Department's production proxy server (i.e., anonymous surfing).

C. For Data Collection and Dissemination

1. Sending or transmitting unencrypted personally identifying information (PII) outside of the Department (e.g., email or other forms of electronic communication). PII includes an individual's first and last name in combination with social security number, credit or debit card number, retirement account number, savings, checking or securities entitlement account number or driver license number or non-operating identification license number.

2. Posting, storing, sending, transmitting, or disseminating any information or material which could be deemed to be defamatory, false, abusive, obscene, pornographic, profane, sexually oriented, threatening, racially offensive, or otherwise biased, discriminatory, or violating or infringing on the rights of any other person.

3. Transmitting unsolicited bulk or commercial messages or "spam." This includes, but is not limited to, unsolicited advertising, promotional materials or other solicitation material, bulk mailing of commercial advertising, chain mail, informational announcements, charity requests, and petitions for signatures.

4. Participating in the collection of email addresses, screen names, or identifiers of others (without their prior consent), a practice sometimes known as spidering or harvesting, or participating in the use of software (including "spyware") designed to facilitate this activity.

5. Using or distributing without benefit for the state any streaming audio or video transmission that could cause congestion, delay, or disruption of service to any state system or equipment. For example "Push" technology, video, sound or other large file attachments.

D. For Illegal and Unethical Activity

1. Undertaking or accomplishing any unlawful purpose. This includes, but is not limited to, posting, storing, transmitting or disseminating information, data or material which is libelous, obscene, unlawful, threatening, defamatory, or which infringes the intellectual property rights of any person or entity, or which in any way constitutes or encourages conduct that would constitute a criminal offense, give rise to civil liability, or otherwise violate any local, state, federal law, order or regulation.

2. Uploading, posting, publishing, transmitting, reproducing, creating derivative works of, or distributing information, software or other material obtained through the Internet or otherwise that is protected by copyright or other proprietary right, without obtaining permission of the owner.

3. Impersonating any person or entity, engaging in sender address falsification, forging anyone else's digital or manual signature, or performing any other similar fraudulent activity.

4. Initiating, perpetuating, or in any way participating in any gambling, betting or gaming activity, including any pyramid or other illegal soliciting scheme.

5. Utilizing the Internet for a personal business or personal gain, including developing or maintaining a personal web page and/or a Web log (blog).

1.07 BUSINESS USE

State owned information technology resources, including access to the Internet, are furnished by the Department for use in conducting state business. The Department does not allow improper use of its information technology resources. Any improper use shall result in disciplinary action up to and including termination of employment. In addition, improper use may result in the initiation of legal action (civil or criminal), or notifying appropriate law enforcement authorities for further action.

1.08 INCIDENTAL USE

Incidental use means non job-related use (i.e., personal use). Incidental use of the Department's Internet access is permitted, but should be restrained and limited to the extent it cannot reasonably be accomplished outside normal work hours without using state owned information technology resources. Reasonable use is allowed, but should only occur before and after normal work hours or during the lunch period. However, it is prohibited if it:

A. Interferes with the user's productivity or work performance, or with any other user's productivity or work performance.

B. Adversely affects the efficient operation of the Department's information resources.

C. Creates additional cost to the Department.

D. Brings discredit or embarrassment to the Department..

E. Involves performing work for profit or results in personal gain.

F. Otherwise violates any local, state or federal law or regulation.

1.09 NO EXPECTATION OF PRIVACY

The Department currently has software and information systems in place that govern Internet access, and inappropriate sites are blocked. All information technology resource usage is monitored and recorded. Every website visited can be traced back to the originator. The Department is able and reserves the right to monitor all traffic on its networks, including but not limited to Internet use, at any time, without prior notice or warning to the user. Anyone using the Department's information technology resources has no expectation of privacy in the use of these tools or any content therein.

ADOT

ARIZONA DEPARTMENT OF TRANSPORTATION
POLICIES AND PROCEDURES

ITM-5.01 ELECTRONIC EQUIPMENT

Effective: October 20, 2014
Supersedes: ITM-5.01 (02/07/2012)
Responsible Office: Information Technology Group, (602) 712-7300

Review: October 20, 2016
Transmittal: 2014 - October
Page 1 of 4

1.01 PURPOSE

To establish an electronic equipment policy for all users, employees and contractors.

1.02 SCOPE

This policy applies to any electronic equipment (e.g., laptops, desktops, telephones, cellular phones, USB flash drives, external hard drives, BlackBerrys, pagers, PDAs, smart phones, tablet computers, scanners and cameras) used to access, print, transmit, or store Department information.

1.03 AUTHORITY

A.R.S. § 41-773 - Causes for dismissal or discipline
A.R.S. § 41-4172 - Anti-Identification Procedures
A.R.S. § 44-7501 - Notification of Breach of Security Systems
A.R.S. § 44-7601 - Discarding and Disposing of Records Containing Personal Information
Statewide Policy, Standards and Procedures Program

1.04 DEFINITIONS

Refer to the Information and Technology Management (ITM) Glossary of Terms on the ITG Web site for definitions and abbreviations.

1.05 POLICY

A. Access and use of the Department's electronic equipment imposes responsibilities and obligations on Department employees and contractors (hereinafter referred to as "users"). Electronic equipment use must be ethical, in accordance with the ADOT Code of Conduct, reflect honesty and shall demonstrate respect for intellectual property, ownership of information and system security mechanisms.

B. Employees are expected to exercise good judgment in their use of the Department's electronic equipment and to refrain from any use or activity that may cause damage to or result in the loss or theft of the Department's electronic equipment or information.

C. All Department data must be encrypted if stored on mobile electronic equipment.

1.06 PROHIBITED USES AND ACTIVITIES

Prohibited uses and activities include, but are not limited to:

A. Using without benefit for the state any streaming audio or video transmission that could cause congestion, delay, or disruption of service to any state system or equipment. For example "Push" technology, video, sound or other large file attachments.

B. Connecting non-ADOT or personal electronic equipment to Department networks or technology resources except for approved remote access. Exemption requests need to be submitted through the ADOT Service Desk by emailing atg@azdot.gov or calling 602-712-7249.

C. Using the Department's electronic equipment as a platform to gain unauthorized access to other systems or equipment.

D. Creating, copying, transmitting, or re-transmitting chain letters or other unauthorized mass mailings regardless of the subject matter.

E. Posting, storing, sending, transmitting, or disseminating any information or material which could deemed to be defamatory, false, abusive, obscene, pornographic, profane, sexually oriented, threatening, racially offensive, or otherwise biased, discriminatory, or violates or infringes on the rights of any other person.

F. Creating, downloading, viewing, storing, copying, printing or transmitting sexually explicit or sexually oriented materials.

G. Creating, downloading, viewing, storing, copying, printing or transmitting materials related to gambling, weapons or terrorist activities.

H. Engaging in any outside fund-raising activity, endorsing any product or service, participating in any lobbying activity, or engaging in any prohibited partisan political activity.

I. Acquiring, using, reproducing, transmitting, or distributing of any unauthorized controlled information including computer software and data, personally identifying, privacy information, copyrighted, trademarked or material with other intellectual property rights (beyond fair use), proprietary data, or exporting controlled software or data.

J. Storing, sending or transmitting any personal identifying information (PII) in an unencrypted form.

K. Engaging in conduct that would constitute a criminal offense, give rise to civil liability, or otherwise violate any local, state, federal law, order or regulation.

L. Using or distributing tools designed for compromising security, such as password guessing programs, decoders, password gatherers, unauthorized keystroke loggers, analyzers, cracking tools, packet sniffers, encryption circumvention devices, or Trojan Horse programs. Unauthorized port scanning, for any reason, is prohibited.

M. Accessing any other person's computer or computer system, software, or data; or attempting to circumvent the user authentication or security of any host, network, or account. This includes, but is not limited to, accessing data not intended for you, logging into or making use of a server or account you are not expressly authorized to access, or probing the security of other hosts, networks, or accounts.

N. Using text features (texting) on Mobile Communication Devices (MCD) while operating motorized equipment.

O. Recording meetings or conversations without prior consent of all participants of the meeting or conversation. This provision does not apply to investigations authorized by the Human Resources Manager.

1.07 USER RESPONSIBILITIES

A. Deleting all content (emails, files, etc.) that is not essential from mobile electronic equipment.

B. Using hands free cell phone devices when operating a vehicle for State business.

C. Ensuring data is stored regularly on Department servers (such as U:\ or G:\ drives) in case the mobile electronic equipment is lost, damaged, or un-recoverable.

D. Reporting lost or stolen mobile electronic equipment to ITG Infrastructure Protection at 602-712-6200.

1. BlackBerry – The loss or theft of a BlackBerry shall be immediately reported to the appropriate supervisor and ITG. The supervisor must contact ITG with the user's name and phone number. ITG is required to immediately erase and de-activate the device.
2. Cell Phone – The loss or theft of the cell phone shall be immediately reported to the appropriate supervisor. The supervisor shall ensure the cell phone provider is contacted so that service on the device is canceled.
3. Laptop – The loss or theft of these devices shall be immediately reported to the appropriate supervisor, ITG and law enforcement. If PII loss is involved, a Statewide Information Protection Center (SIPC) Incident Report will be prepared and submitted in accordance with Statewide Standard P900-S905, Incident Submission and Response. Contact ITG Infrastructure Protection at 602-712-6200 for the form and preparation information.
4. USB flash drive and other data storage devices – The loss or theft of these devices shall be immediately reported to the appropriate supervisor and ITG. If PII loss is involved, a Statewide Information Protection Center (SIPC) Incident Report will need to be prepared and submitted in accordance with Statewide Standard P900-S905, Incident Submission and Response. Contact ITG Infrastructure Protection at 602-712-6200 for the form and preparation information.

E. Contacting the ADOT Service Desk at 602-712-7249 for deactivation of an electronic device.

1. BlackBerry devices that are scheduled to be taken out of service shall be returned to the appropriate supervisor. ITG must be contacted to deactivate or reissue the device.
2. Cell phones that are scheduled to be taken out of service shall be returned to the appropriate supervisor. The supervisor is responsible for deactivation by the cell phone provider.
3. Laptops that are scheduled to be taken out of service shall be returned to the appropriate supervisor. ITG must be contacted to ensure that data cleansing is performed prior to reissue or surplus of the laptop.

1.08 BUSINESS USE

State owned information technology resources, including electronic equipment, are furnished by the Department for use in conducting state business. The Department does not allow improper use of its electronic equipment. Improper use shall result in disciplinary action up to and including termination of employment. In addition, improper use may result in the initiation of legal action (civil or criminal), or notifying appropriate law enforcement authorities for further action.

1.09 INCIDENTAL USE

Incidental use is non-job-related use (i.e., personal use). Incidental use of the Department's electronic equipment is permitted, but should be restrained and limited to the extent it cannot reasonably be accomplished outside normal work hours without using state owned electronic equipment. Reasonable use is allowed, but should only occur before and after normal work hours or during the lunch period. However, it is prohibited if it:

A. Interferes with the user's productivity or work performance, or with any other user's productivity or work performance.
B. Adversely affects the efficient operation of the Department's information resources.
C. Creates additional cost to the Department.
D. Brings discredit or embarrassment to the Department.
E. Involves performing work for profit or results in personal gain.
F. Otherwise violates any local, state or federal law or regulation.

ADOT

ARIZONA DEPARTMENT OF TRANSPORTATION
POLICIES AND PROCEDURES

ITM-6.01 INFORMATION SECURITY

Effective: October 1, 2014
Supersedes: ITM-6.01 (2/7/2012)
Responsible Office: Information Technology Group (602) 712-7300

Review: October 1, 2016
Transmittal: 2014 - October
Page 1 of 5

1.01 PURPOSE

To establish an information security policy to implement and maintain information security controls that protect the Department's information and technology resources. This policy ensures the confidentiality, integrity, and availability of Department information.

1.02 AUTHORITY

Arizona Revised Statutes (A.R.S.) § 41-3504(A)(1) – Powers and duties of the department; violation; classification
A.R.S. § 41-773 – Causes for dismissal or discipline

1.03 DEFINITIONS

Refer to the Information and Technology Management (ITM) Glossary of Terms on the ITG Website for definitions and abbreviations.

1.04 POLICY

A. The Department shall securely protect its information and technology resources from unauthorized and/or inappropriate access, use, disclosure, disruption, modification, or destruction. The Department will comply with legal requirements established by existing federal and state statutes, this policy, and its related standards, guidelines and procedures pertaining to the confidentiality, privacy, accessibility, availability, and integrity of Department information and technology resources.

B. All budget units responsible for information technology operations or support and maintenance of information systems shall utilize Enterprise Architecture (EA) target technologies, methodologies, standards, and best practices to develop, implement, and/or acquire computer hardware systems, software systems, application systems, operating systems, security systems, and networking systems (reference Statewide Policy P700, Enterprise Architecture). All budget units shall comply with all domains of the state's EA and associated domain policies.

C. State owned information and technology resources are furnished by the Department for use in conducting state business. The Department does not allow improper use of its information and technology resources. Improper use shall result in disciplinary action up to and including termination of employment. In addition, improper use may result in the initiation of legal action (civil or criminal), or notifying appropriate law enforcement authorities for further action.

1.05 RESPONSIBILITIES

A. Information security program

Infrastructure Protection (IP) is responsible for the following:

1. Minimizing the level of risk associated with the confidentiality, integrity, and availability of information.

2. Overseeing Department compliance with applicable federal and state laws, codes, rules, and regulations. IP assists in the enforcement of Department policies, standards, guidelines and procedures regarding the protection of information resources.

B. Risk Assessment

All budget units responsible for information technology operations or support and maintenance of information systems shall conduct annual information risk assessments as required by Statewide Standard P800-S805, IT Risk Management. Assessments shall be submitted to ITG Infrastructure Protection each year on or before July 1.

C. Account Management

1. The Department shall document and maintain a procedure directing the steps and the timing for granting or withdrawing system and information access privileges. Budget units are responsible for employing access control methods as defined in the ITM-10.02 Account Management Standard. These access control methods authenticate and confirm authorization for the access level requested and provide required audit trail for access (granted or denied) to Department information and technology resources.

Each user of Department information and technology resources shall sign an acknowledgement of their responsibilities for Acceptable Use and an Information Access and Non-Disclosure prior to gaining access. A Computer Access Request (CAR) must be submitted to ITG Infrastructure Protection for all network access (additions, deletions or changes). CAR preparation and routing requirements are outlined in the ITM-10.02 Account Management Standard.

D. Authentication and Directory Services

1. To safeguard critical application systems, information, and networks from unauthorized access or intrusions, the Department shall ensure identity and authentication of a user/customer before granting access to resources and services. Lightweight Directory Access Protocol shall be used as the standard for client-to-server communication and directory services. Authentication requests for a service in a computer network shall be encrypted (i.e., user/customer passwords shall be highly secured as they traverse the network).

2. Information technology units within the Department shall ensure that directory services and client-server communication comply with Statewide Standard P800-S820, Authentication and Directory Services.

3. To better manage administration and security of Department computers, all PCs shall be configured as members of approved Active Directory domains.

E. Network Security

1. The Department shall deploy a defense in depth, or multi-layered protection, approach to infrastructure protection.

2. The Department shall defend its infrastructure by securing local and wide area communications networks; providing confidentiality and integrity protection for data transmitted over these networks; defending its perimeter to resist active network attacks; and protecting its computing environment by preventing malicious code or unauthorized access to Department information and technology resources.

F. Incident Response and Reporting

1. ITG IP manages a Computer Incident Response Team (CIRT) for the purpose of restoring normal Department computer operations in the event of a computer security incident that has an adverse effect on information and technology resources (e.g., data loss, service interruption, theft, abuse, etc.).

2. ITG IP security@azdot.gov must be contacted immediately regarding a computer security incident involving the loss or theft of equipment or data, the compromise or destruction of system files, or denied services (reference Statewide Standard P900-S905, Incident Submission and Response).

G. Virus and Malicious Code Protection

1. To strengthen and safeguard networks, IT components, and data from software contaminants, the Department shall protect all PCs and servers with antivirus-scanning software and ensure all remote PCs and servers that access internal networks are protected with effective antivirus scanning software equivalent to that used by the Department.

2. Antivirus software shall be configured to automatically apply the most current, tested, inoculants and patches to Department information systems.

3. Users are prohibited from disabling antivirus software.

H. Patch Management

1. To strengthen and safeguard networks, IT components, and data from software contaminants, the Department shall protect all PCs and servers with system patches and ensure that all remote PCs and servers that access internal networks are protected with system patches equivalent to that used by the Department.

2. Patch management software shall be configured to automatically apply the most current, tested patches to Department information systems.

3. Users are prohibited from disabling patch management software.

I. Backups

In order to recover from service interruptions in a timely manner and to restore critical information and services, responsible budget units shall perform data backups as defined in Statewide Standard P800-S870, and ADOT Policy ITM-7.01 Backups.

J. System Maintenance

1. All budget units responsible for information technology operations or support and maintenance of information systems are responsible for employing maintenance control methods that include the scheduling, performance and documentation of routine preventative and regular maintenance of information and technology resources.

2. Budget units shall adhere to Department change control processes and procedures that govern and provide accountability for changes to IT infrastructure and configurations and associated software components.

K. Media Sanitization/Disposal

1. The Department shall perform data sanitization for removing data/files from storage media to the extent that the data/files are not recoverable.

2. The Department shall perform the overwriting method of sanitization when redeploying or disposing of information and technology resources.

3. Prior to the off-site repair of IT devices, network components, operating system/application software, or storage media, the Department shall remove all sensitive (confidential and/or personal information) data from IT devices, network components, operating systems, application software, and storage media.

4. In the event that the storage media is unable to be repaired, it will be destroyed.

L. IT Physical Security

1. Information technology equipment (e.g., servers, storage, client devices, etc.) and related communication wiring and network devices shall reside in secure locations (i.e., locked, restricted to authorized personnel). Physical access security measures employed for backup systems/facilities shall be equivalent to those of the primary facilities. Information systems and related communication wiring and network devices are protected against loss or malfunction of environmental equipment or services necessary for the operation of the facility.

2. Computing and telecommunications equipment shall be inventoried, accounted for, and safeguarded from loss and resulting unauthorized use.

3. Removable storage media (e.g., disk, tapes, CDs, etc.) are controlled and labeled to guard against misplacement and loss or unauthorized use of information.

M. Personnel Security

1. System, application, and information access shall only be granted in accordance with a formal, written, and auditable procedure.

2. Permissions, or rights, shall be granted in accordance with group or role membership(s) based on job functions and assignments.

3. Supervisors and managers shall identify the user's job, determine the minimum set of privileges required to perform that job, and restrict the user to those privileges and nothing more.

N. Security Training and Awareness

1. The Department is responsible for ensuring that all persons, using Department information resources, complete information security awareness training at hire and on a routine basis thereafter.

2. The receipt of information security awareness training must be documented and maintained on file.

3. Training content shall be created and regularly reviewed to ensure that it addresses the Department's organizational mission, culture, business, technology, systems, and data/information.

ADOT

ARIZONA DEPARTMENT OF TRANSPORTATION
POLICIES AND PROCEDURES

ITM-10.02 Account Management Standard

Effective: October 20, 2014 Review: October 20, 2016
Supersedes: ITM-10.02 (1/20/2012) Transmittal: 2014 - October
Responsible Office: Information Technology Group, (602) 712-7300 Page 1 of 4

1.01 PURPOSE

To establish uniform business rules and operating practices for the creation, monitoring, control and removal of user accounts.

1.02 SCOPE

This standard applies to all users (i.e., employees and contractors) that access the Department's information and technology resources).

1.03 DEFINITIONS

Refer to the Information and Technology Management (ITM) Glossary of Terms on the ITG Web site for definitions and abbreviations.

1.04 BACKGROUND

Computer accounts are the means used to grant access to the Department's information and technology resources. These accounts provide accountability for user actions and resource usage. Creating, controlling, and monitoring computer accounts is important to overall security.

Access and use of the Department's information and technology resources poses certain responsibilities and obligations on the Department's employees and contractors (hereinafter referred to as "Users"). All access and use must be ethical, in accordance with the ADOT Code of Conduct, reflect honesty and demonstrate respect for intellectual property, ownership of information and system security mechanisms.

Access in network environments begins with proof of identity. Only properly authenticated, authorized individuals are allowed access to the network. Two-factor authentication is a requirement for remote access.

1.05 STANDARD

A. Users must demonstrate acceptance of their responsibilities and obligations by electronically signing an Acceptable Use Agreement and an Information Access and Non-Disclosure Agreement prior to gaining access to the Department's information and technology resources.

B. Users must have a uniquely identifiable and individually assigned user ID/password combination (hereafter referred to as "User ID") to ensure accountability for actions and resource utilization.

C. All accounts that convey access privileges require an associated Computer Access Request and appropriate supervisory approval for all access that is granted to Department systems or services.

D. All User accounts that have not been accessed within 60 days will be disabled.

E. Passwords, security tokens (i.e. smartcard), and other computer security procedures and devices shall be protected by the individual user from use by, or disclosure to, any other individual or organization. All security violations shall be reported to ITG Infrastructure Protection immediately.

F. At a minimum, the Department requires passwords be subject to the following:

1. Minimum of 8 characters
2. Consist of a combination:
   a. Upper case characters (e.g., ABCDEGH)
   b. Lower case characters (e.g., abcdefgh)
   c. Digits (e.g., 1234567890)
   d. Symbols (e.g., !@#$%^&*)
3. Cannot be reused for a period of 720 days
4. Changed at least every 30 days, or more frequently based on risk

B. ITG Infrastructure Protection shall:

1. Establish methods, processes, and procedures that generate logs of sufficient detail to create historical audit trails of individual user account access activity for a minimum of 90 days.

2. At least annually, verify access privileges to protected information to confirm that access privileges are correct and that they correspond with the Department's needs and appropriate personnel roles and responsibilities.

1.06 PROCEDURES

The Department's supervisors are responsible for authorizing information and technology access privileges. Users should be granted sufficient access to perform their job duties and no more. Supervisors are also responsible for changing or updating User access privileges in relation to job status changes.

A. New accounts
   1. Supervisor:
      a. Complete and sign the Computer Access Request.
   2. User:
      b. Electronically sign an Acceptable Use Agreement.
      c. Electronically sign an Information Access and Non-Disclosure Agreement.

B. Account changes
   1. Supervisor:
      a. Separation - Complete and sign the Computer Access Request. Specify the 'separation date'.
      b. Transfer (receiving supervisor) – Complete and sign the Computer Access Request. Specify 'transfer' and request access privileges required for the job position.
      c. Access modification(s) - Complete and sign the Computer Access Request. Select "requested access".

C. Computer access request routing
   1. Open a request with the ADOT Support Desk by emailing atg@azdot.gov or calling 602-712-7249.
   2. Fax completed Computer Access Request form to ITG Infrastructure Protection @ 602-712-3368.

1.07 GUEST ACCESS

The Department provides both wired and wireless (where available) connectivity to guests requesting access to the Internet. The following conditions apply to all guest accounts:

A. Anonymous access will not be granted.
B. All guest access must be requested 48 hours in advance of anticipated use.
C. Guest accounts may be utilized for up to 14 consecutive days.
D. Access required beyond this timeframe requires:
   1. Acceptable Use Agreement
   2. Information Access and Non-disclosure Agreement
   3. Computer Access Request
E. Guest accounts will only be active from 6AM to 6PM, Monday through Friday.
F. New guest Internet access is requested by contacting the ADOT Support Desk through email at atg@azdot.gov or calling 602-712-7249.

Note: Guest name, business name/address/phone, and duration of account use must be provided.

1.08 PUBLIC ACCESS

General access to public services within the Department, such as general use PCs or kiosk computers requires no special authorization. However, misuse of these services including attempts to circumvent network security controls or gaining unauthorized access is not tolerated by the Department. Any improper use shall result in disciplinary action, including the initiation of legal action (civil or criminal), or notifying appropriate law enforcement authorities for further action.

1.09 NON-DISCLOSURE

Anyone that has access to information and technology resources within the Department may be exposed to sensitive (confidential or personal) data. It is the responsibility of all Users to protect sensitive data from unauthorized access, use, disclosure, disruption, modification, or destruction as referenced in Statewide Policy P800, IT Security. Non-disclosure agreements outline specific guidelines around information confidentiality. Prior to being granted access to Department information and technology resources, a non-disclosure agreement shall be electronically signed by all Users.

Abbreviations and acronyms used without definitions in TRB publications:

A4A	Airlines for America
AAAE	American Association of Airport Executives
AASHO	American Association of State Highway Officials
AASHTO	American Association of State Highway and Transportation Officials
ACI–NA	Airports Council International–North America
ACRP	Airport Cooperative Research Program
ADA	Americans with Disabilities Act
APTA	American Public Transportation Association
ASCE	American Society of Civil Engineers
ASME	American Society of Mechanical Engineers
ASTM	American Society for Testing and Materials
ATA	American Trucking Associations
CTAA	Community Transportation Association of America
CTBSSP	Commercial Truck and Bus Safety Synthesis Program
DHS	Department of Homeland Security
DOE	Department of Energy
EPA	Environmental Protection Agency
FAA	Federal Aviation Administration
FAST	Fixing America's Surface Transportation Act (2015)
FHWA	Federal Highway Administration
FMCSA	Federal Motor Carrier Safety Administration
FRA	Federal Railroad Administration
FTA	Federal Transit Administration
HMCRP	Hazardous Materials Cooperative Research Program
IEEE	Institute of Electrical and Electronics Engineers
ISTEA	Intermodal Surface Transportation Efficiency Act of 1991
ITE	Institute of Transportation Engineers
MAP-21	Moving Ahead for Progress in the 21st Century Act (2012)
NASA	National Aeronautics and Space Administration
NASAO	National Association of State Aviation Officials
NCFRP	National Cooperative Freight Research Program
NCHRP	National Cooperative Highway Research Program
NHTSA	National Highway Traffic Safety Administration
NTSB	National Transportation Safety Board
PHMSA	Pipeline and Hazardous Materials Safety Administration
RITA	Research and Innovative Technology Administration
SAE	Society of Automotive Engineers
SAFETEA-LU	Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (2005)
TCRP	Transit Cooperative Research Program
TDC	Transit Development Corporation
TEA-21	Transportation Equity Act for the 21st Century (1998)
TRB	Transportation Research Board
TSA	Transportation Security Administration
U.S. DOT	United States Department of Transportation

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